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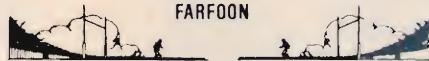
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Jim Benson

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Jerry Younkins

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COVER:

The small southern California town of Coalinga was heavily damaged on May 2, 1983 by an earthquake measuring 6.5 on the Richter Scale. California has been rocked by severe earthquakes but one of the worst quakes on record occurred in Missouri. The lives and property of tens of millions of Americans are at risk from earthquakes. See pages 22, 25 (Cover photo courtesy of the U.S. Geological Survey).

SURVIVALIST DIRECTORY

THIS IS A CONFIDENTIAL listing of survivalists who wish to become known to others of like mind. *American Survival Guide* will accept properly coded mail, and forward it to the coded addressee, without charge. *American Survival Guide* accepts no responsibility for the contents of these confidential survivalist communications:

ASG 0201

Arleta, California, interested in joining a survival group in Los Angeles area. Carpenter/cabinetmaker equipped and dedicated, willing to use skills to help build and/or accessorize a retreat. Own many guns and tools. Hard work for self sufficiency and life appealing.

ASG 0202

Lafayette, Indiana, individual looking for sincere survivalists to form small, close-knit survival group. Interested in survival training, shelter, hunting and physical preparedness.

ASG 0203

Phoenix, Arizona, seek other Phoenix area survivalists interested in starting a group, or would like to join an existing survival group.

ASG 0204

Muncie, Indiana, small survival group wants to exchange ideas and values with other survivalists.

ASG 0205

Sacramento, California, survival group looking for new members in the Sacramento-Roseville-Folsom area and alliances with other northern California survival groups.

ASG 0206

Calgary, Canada, survivalist wishes contact with other survivalists in Calgary area for dialogue and possibly forming survival group.

ASG 0207

Cincinnatus, New York, dedicated survivalist wishes to contact persons interested in survival in central New York.

ASG 0208

Tulsa, Oklahoma, Osage County survivalist would like to exchange information and correspond with other survivalists in northeastern Oklahoma.

ASG 0209

Thunder Bay, Canada, self-reliant person wishes to start group in northwestern Ontario, or to join existing group for long-term self sustaining and self reliance in any disaster. Also desire correspondence with other groups.

ASG 0210

Corona del Mar, California, would like to correspond with patriotic Christians in central and northern California.

ASG 0211

Temple City, California, female interested in self reliance/independence wishes to contact other individuals or groups in southern California/southwest Colorado.

ASG 0212

Ossining, New York, person on East Coast wants to contact others in U.S. on subjects of survival, guns, and self reliance.

ASG 0213

Lithonia, Georgia, group being formed by ex-paratrooper, school trained CBR NCO, looking for members and mutual assistance pacts with others. Can assist in training in CBR, and infantry small unit tactics, also improvised munitions.

ASG 0214

Frederick, Maryland, individual interested in civil defense and helping others through difficult times would like to correspond with like-minded people.

ASG 0215

Conroe, Texas, 19-year-old, new as a survivalist, would like to contact other survivalists, ages 17 to 19.

ASG 0216

Ft. Lauderdale, Florida, discreet, affluent, large yacht owner survivalist seeks contact with other of similar circumstances in south Florida.

ASG 0217

Benton Harbor, Michigan, trying to organize a small coop to help people that want to help people. Looking for ideas on communication, agriculture, transportation, perpetual power, laboratories, magnetic currents, technological advancement.

ASG 0218

Chattanooga, Tennessee, long time survivalist family would like contact with others.

ASG 0219

Annandale, Virginia, would like to correspond with others in Virginia who are interested in buying and working on a small farm in southern Virginia; Also any other Virginia-based survivalist.

ASG 0220

Salem, Oregon, ex-state police security specialist wishes to help put together a group of people in this area interested in survival and to offer training in security, weapons and survival equipment.

ASG 0221

Phoenix, Arizona, looking for adult to help form a junior survivalist group involving survival camps (like Boy Scouts of America).

ASG 0222

Cave Junction, Oregon, group of dedicated, yet informal survivalists may accept new members (Combat experience preferred but not necessary).

ASG 0223

Beach Grove, Indiana, individual interested in forming small survival group in Indianapolis area.

ASG 0224

Chicago, Illinois, forming survival group in southwest Chicago area seeking members. Military, medical, police, electronic communication backgrounds preferred but not necessary. Send personal information and background resume.

ASG 0225

Columbus, Georgia, group would like to establish contact with other survivalists in the area with the goal of establishing a self-reliant organization.

ASG 0226

Belmar, New Jersey, interested in contacting any survival group in the central area of Texas, or in the Ft. Worth area.

ASG 0227

St. Clair Shores, Michigan, would like to make contact with survivalists in the area, for possibility of forming a group.

ASG 0228

Delaware County, Pennsylvania, seeks contact with other survivalists in area who wish to form a group.

ASG 0229

Fairfax, Virginia, Christian survivalist desires contact with other survivalists/self-reliant people of like mind. Responses welcomed from all levels of involvement.

ASG 0230

Northern Minnesota, individual seeking out other young persons interested in survivalism. Any country or state welcome.

ASG 0231

Chiefland, Florida, 16-year-old interested in contacting other young survivalists in the U.S., Canada and Australia for possibility of forming teenage network.

ASG 0232

Twin Cities, Minnesota, armchair survivalist couple want to get involved with group or individuals with practical experience or knowledge in the Twin Cities area.

ASG 0233

Ontario, Canada, 22-year-old single male survivalist in northern Ontario would like to hear from all survivalists and groups anywhere for correspondence and information exchange. Meeting may be possible.

Address response letters as follows:

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Your letters will be forwarded to persons listed within two days of receipt. *American Survival Guide* accepts no responsibility for loss or delay of inquiry letters. Contact letters that do not carry the appropriate code number will be discarded.

Those who wish to be added to the directory listing, please send names and addresses to *American Survival Guide*, 2145 West La Palma Avenue, Anaheim, CA 92801. The listing is free. ●

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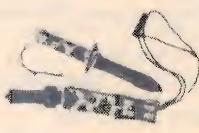
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TO THE POINT

On the road, there was a burglary, a fire, and some survivalist thinking . . .

SALLY AND I had occasion to do some traveling lately. During the time spent on the road, we stayed several nights in a motel in Dallas, Texas. This seems straight-up enough, but during our stay a couple of incidents occurred that raised our survival hackles.

During one night of our stay, a room just down the hall from ours was burglarized. The word was that the man and wife who were renting the room were in the motel's cocktail lounge when the thieves forced their dead-bolted door open, apparently with a screwdriver, and proceeded to remove articles of value, including money, an expensive camera, and costly luggage, containing the couple's clothing.

Shortly before the time of the after-midnight burglary, there was a pounding on our door. A voice called, "Room service!" I yelled back sleepily, "We didn't order anything from room service." And then I rolled over and went back to cutting Zs. What I should have done is call the front desk, or security, or whoever was responsible for seeing that this particular motel does not entertain burglars. Or, at least I should have looked to see whether the guy who yelled, "Room service!" was wearing a white jacket and had a napkin over his arm. I did neither, much to my regret.

Motels, hotels, rental condos, and other sorts of dwellings for transient folk are prime targets for nighttime footpads.

There are on the market any number of locking devices for hotel closets, motel dresser drawers and the like. There are small personal alarm systems for under \$50 that detect intruders with an infrared or ultrasonic beam—and these make a terrific shriek, loud enough to scare off a burglar.

The people who lost their goods didn't do their part by tending to their own security. I didn't do my part in the battle against crime by checking out the likely bogus room service waiter. Maybe the people who lost their gear don't know about things like this. I do. I'm ashamed of myself.

Another night, about 2:35 o'clock in the morning to be exact, Sally and I were bolted awake by a strident "Beep! Beep! Beep! Beep!" This awful, penetrating sound came from outside our door.

"Lord, honey, it's a fire alarm. Grab your robe and let's get out of here!" I shouted.

I snatched up a pair of pants and my leather sport jacket against the chill, and we went out into the corridor on the second floor of this three-story motel wing. Immediately we located the well-lighted "Fire

Exit" sign over a wide doorway leading to the steel fire stairs.

Both of us know better than to use an elevator, even for descending a floor or two, when a building is on fire.

We clanged our way down the metal fire stairs and out a first-floor emergency exit. Of some 200 guests in the motel wing, only one other person stood with us outside this doorway.

I couldn't smell smoke. Neither could I see flames. However, there was a fire truck in the parking lot, which to me was sufficient reason for leaving the building at maximum hurry.

We waited around. Nothing happened. The loud alarm system was switched off. A harried-looking waiter appeared and said cryptically, "All clear. You can go back to your rooms now." "Thanks," we told him, and headed back to our room.

On our return, we saw numbers of people peering out of cracked doorways. One lady queried, "Was it a fire?"

The point is that 99 percent of the guests in this motel failed to heed a really loud fire alarm. Maybe they didn't want to be seen waltzing about in their PJs or tatty bathrobes—or naked, for that matter.

For our parts, we'd rather appear in public starkers than deceased. Who worries about how they look or how they are dressed during a fire? A lot of people apparently.

I got to thinking about the MGM Grand Hotel fire in Las Vegas some years back, and about how quickly motels and hotels can burn to the ground. I thought about bodies piled at the bottom of hotel emergency stairwells. I thought about USAF helicopter crews winching people off roofs. I thought about fire. And I was glad for my love, Sally, and myself that I am thoroughly afraid of fire. When an alarm sounds, we git!

That is sort of survivalist way of thinking. First it is necessary to be aware of what can happen, be it burglary or fire. Next, it's required that one know what to do about a particular situation that threatens loss of property or, more seriously, loss of life. The third step is action, pure and simple. It's all well and good to know that burglars can rob you, and that hotel rooms can become your crematorium, but it's up to you, if you claim to be a survivalist who wishes to survive, no matter what, to know.

Knowledge is your best defense, and, should the time come, your surest means of counterattack. Survivalism is knowledge. Survivalists are knowledgeable. To know is to survive.—Dave Epperson.

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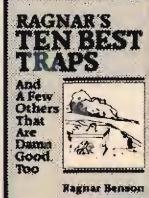
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THE MINI-14 EXOTIC WEAPONS SYSTEM

Use this home workshop guide to convert your Mini into a selective-fire, silenced, S.W.A.T.-type weapon capable of field-clearing firepower. Provides complete workshop plans, 40 close-up photos and full-scale templates. This conversion process requires no machining or special tools. Once completed, it takes just five minutes to drop in the Automatic Connector (the book's secret!) or remove it as needed. Also includes detailed plans for a quick-and-easy caliber .223 silencer. 9 x 12, softcover, photos, templates, 72 pp.

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GET EVEN:

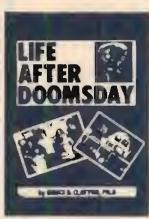
The Complete Book of Dirty Tricks
A hilarious overview of the methods people use to get even with big business, government and enemies. More sophisticated and involved tricks are included, such as ones devised by CIA and Mafia members and political dirty tricksters. Over 80 sections present dirty tricks ranging from the simple to the elaborate. 5½ x 8½, hardcover, 192 pp.

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Here is a conversion system you can bet your life on! Now you can transform your Ruger 1022 into a selective-fire, close-combat gun you can trust. With simple hand tools, you can build the parts that will convert your trusty Ruger 1022 into a selective-fire weapon that can fire over 1,000 rounds per minute on full auto—all without modifying the receiver or trigger housing in any way. Just drop in the conversion parts, and you're ready for whatever—or whomever—comes. Over 60 explicit photos, machinist's drawings and full-scale templates accompany the detailed instructions for making this conversion foolproof. 9 x 12, softcover, illus., 96 pp.

\$15.00

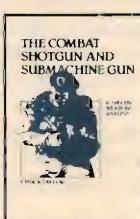


LIFE AFTER DOOMSDAY

by Bruce Clayton, Ph.D.

Who will survive the nuclear war that many experts predict is coming? *Life After Doomsday* tells you how to survive such a radioactive nightmare. Includes eye-opening information about shelters, food storage, home medical techniques, survival psychology, and shelter defense. 5½ x 11, hardcover, charts, drawings, photos, 180 pp.

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by Chuck Taylor

From one of America's most sought-after shooting instructors comes an in-depth analysis of these two controversial small arms. Taylor provides a comprehensive education in the use of these commonly misemployed guns. Includes info on field testing, drills, tactics, accessories and techniques. 8½ x 11, softcover, 385 photos, 176 pp.

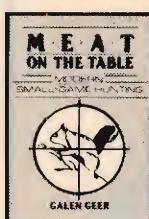
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THE AR-15/M16: A PRACTICAL GUIDE

by Duncan Long

The AR-15/M16, the inspiration for so many modern assault rifles, is covered here in this definitive book. Should you wish to build your own or convert it to auto fire, Duncan Long supplies you with parts and tool lists and detailed step-by-step instructions. Virtually any accessory you may wish to buy for your AR-15 is listed. Invaluable to the M16 owner, this comprehensive book also covers assembly and disassembly, conversion kits and modifications, troubleshooting, ammunition, combat use, lubrication and more. 8½ x 11, softcover, photos, 168 pp.

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MEAT ON THE TABLE Modern Small Game Hunting

by Galen Geer

The brush suddenly explodes with a zigzagging ball of fur—and the hunt is on. From the mundane prairie dog to the sublime wild turkey, there are over 40 species of small game, and Galen Geer tells you about each one: where it can be found, its habitat, its table fare, and the right hunting arm and ammo. A truly comprehensive course. 5½ x 8½, hardcover, photos, illus., tables, 216 pp.

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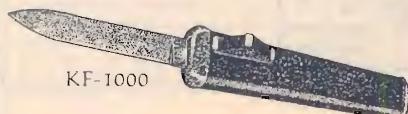
Kung-Fu Charlie

PRESENTS

THE SWITCH-A-ROO KNIVES
SWITCH-A-ROO I

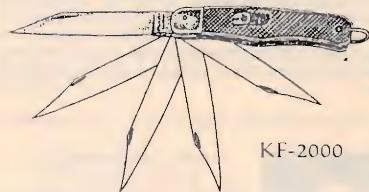


SWITCH-A-ROO I is not a cheap toy. Genuine European style Switchblade Knife fully assembled and made in the style of old world craftsmen. The SWITCH-A-ROO I comes delivered to you with a functional chromed metal comb blade, and a full length, quality stainless steel knife blade honed to exacting sharpness. SWITCH-A-ROO I operates in and out within a 100th of a second. Carry with comb or stainless blade that you change yourself in seconds.



Extra blades for SWITCH-A-ROO I
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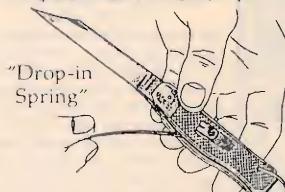
SWITCH-A-ROO II



KF-2000

SWITCH-A-ROO II is of the same quality and workmanship as the SWITCH-A-ROO I. It is delivered fully assembled as a functional "Lock Blade" Knife, but when you add the drop-in forged spring, it becomes a fully functional switch blade knife. Carry as a simple lock blade or drop-in the forged spring. You remove or drop-in the spring in just seconds with no tools... a flick of the button and the blade springs open! One free spring included with knife.

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OR

SWITCH-A-ROO II

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Kung-Fu Charlie

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SURVIVAL LINE

SARSAT, terrorist attacks, economic warning, Star Wars support, home schooling, traveling abroad . . .

VIETNAM VETERAN and amateur mariner Jack Boye is alive today thanks to the joint efforts of U.S. and Soviet space scientists. Mr. Boye was sailing his boat, the *Dear America*, from New York City to Miami when his radio equipment failed. Because of the loss of his radio he was caught unaware by a sudden and violent storm. The storm knocked out his engine and instruments and left him adrift at sea.

Fortunately Mr. Boye had on board an Emergency Position Indicating Radio Beacon which he switched on. Its signal was picked up by a Soviet satellite. The Soviet satellite relayed the position information to the Rescue and Command Center at Scott Air Force Base, Illinois. The Rescue and Command Center alerted the Coast Guard which dispatched the boat and rescued Mr. Boye 140 miles off Cape Henry, Virginia.

The system used by Mr. Boye is called SARSAT, Search and Rescue Satellite, and consists of two U.S. and three Soviet satellites. In the few years since the system started operations it has helped rescue more than 400 people.

Terrorist Threats Increasing—The U.S. for the first time is beginning to take seriously the possibility of terrorist attacks aimed at the two largest overseas U.S. military installations in the world, Clark Air Base and Subic Bay Naval Base in the Philippines. U.S. Marines have begun to actively patrol the base perimeters in response to the growing threat posed by communist rebels.

U.S. and NATO allies are very concerned by the massive escalation of terrorist attacks aimed at NATO facilities and personnel in Europe. In the past year 30 bomb attacks were carried out against NATO buildings and almost 200 other bombings were targeted against NATO pipelines, radio towers, pumping stations, etc. The bombings have caused the death and injury of a number of U.S. and European NATO personnel.

Economic Armageddon Warning—In a new book entitled *The Warning*, Joseph Granville, an economic forecaster, says we are coming closer than ever to a "financial Armageddon." He cites almost 200 current

economic conditions which parallel conditions prevalent in 1929, the year of the stock market crash. Among the conditions cited are the current farm crisis, large scale bank and brokerage house scandals, and the continuing rise in bank failures.

While final year-end figures are not yet complete, Survival Line has learned that the number of bank failures in 1985 will surpass the record of 78 such failures set last year.

Star Wars Group—A new group, the Coalition for the Strategic Defense Initiative, has been formed in order to counter the critics of the Star Wars (SDI) program. The coalition is a collection of more than 100 independent organizations along with more than 85 members of Congress. The goal of the group is to mobilize support for the SDI on the grassroots level. More information can be had by contacting: Coalition for the Strategic Defense Initiative, 1010 Vermont Avenue, N.W., Suite 1016, Washington, D.C. 20005.

Home Schooling Growth—Home schooling has been making a comeback in a number of states recently. Michigan is the latest state to consider legalizing the teaching of children at home. Some 500 supporters of the home schooling legalization effort recently rallied outside the state Capitol building in Lansing, Michigan, as the legislation was being considered. As of press time no decision has been made.

Travel Tips—At least 5,000 Americans were arrested last year during trips abroad. Their "crimes" ranged from carrying a copy of *Playboy* to overcharging credit cards. Automobile accidents also accounted for many arrests since in many countries local police will arrest all parties involved and sort out the details later. Travel agents and the State Department urge you to become familiar with the laws of the country you are planning to tour before you get there. The State Department has a phone number that you can call for updated reports on the political and social conditions of the country you are planning to visit. Travel restrictions and safety advisories for U.S. citizens abroad are available. Call (202) 632-5225 for further information. •

MAIL CALL.

Gas Masks: British View

I have read with great interest the article "Gas Masks" in the November 1985 issue of *ASG* by your contributor Duncan Long, who certainly knows what he is talking about, and, I would recommend that all survivalists study the article closely. The very situation of the British Isles and its close proximity to continental Europe renders it more likely, than say North America, to be a target for a chemical attack, or to be at the receiving end of toxic material carried for miles by prevailing winds from battlefields far away. Survival groups grow in number in the British Isles, there are clubs and you can go on organized courses on surviving out of doors and in self-sufficiency. However, there are a growing number of groups and individuals who are taking very seriously nuclear, biological and Chemical survival. Gas masks (we over here call them respirators) figure prominently as the most essential item along with plastic suits to protect the body against nuclear fallout or chemical vapor or liquid, and no survivor should be without one. We have a deep suspicion here of all surplus gas masks, survivors prefer new ones which are readily available mostly made in Scandinavia. All these types have the standard 40mm round thread filter inlet, which is now standard with all NATO armed forces excepting the United States, and so they can take any filter with this screw thread. Any filter without a makers seal over the ends should be rejected, and as the active life of the carbon content if unopened can be between 10 and 20 years, see that the filter is not more than four or five years old, most have a date or date code stamped on them. The most popular respirator being sold for civilian defense in the British Isles is the side filter Helly-Hansen LF-62 followed by the type IMA by the same maker which has a front filter. A mask type A-62 size 5 is also sold for children from between the ages of about 3 and 8. I note with interest that the Israeli Civilian/Civil Defense mask is on sale in the U.S.A., this mask has a 40mm filter inlet, and is a very good and gas-tight product but not as comfortable as the Helly-Hansen LF-62. The American M-9 mask is still standard issue to both the Swedish and Irish armies, and filters to the 60mm screw-in thread are still being made by Flodin AB of Lysekil, Sweden, which may well have a North American agent. Also adaptors are available to convert 60mm inlets to the now almost universal 40mm inlet, and these cost only about \$1 each. The price range in

Britain for the LF-62 and IMA masks and filters ranges from about \$80 to \$60 but bear in mind extra carriage is involved and you may have to pay duty on arrival. The best known British stockists for respirators are Rucksack N' Rifle, 12 Abbot Street, WREXHAM, North Wales, LL11 1TA Great Britain; and Wessex Survival Services, 8 Overybury Road, Parkstone, POOLE, Dorset, BH14 9JL Great Britain. I can personally recommend the LF-62 mask as I recently took part in a survival exercise lasting 46 hours with full NBC equipment.

George S. Hearse
Isle of Man, Great Britain

Very interesting reading about what's going on with gas masks—respirators—on the other side of the Atlantic. This article generated several letters on the subject and we'll be running more of them. Thanks for the information and your interest in ASG.

Wildfire

For quite a long time I've been waiting and watching for a good article on protection of home and property from wildfire. There had been literature aplenty on guarding against fire from within but I'd seen none on fire approaching from without. I'm not a bit surprised that *ASG* is the publication in which such an article now appears ("Wildfire" December 1985). Seems like most folks who live in chaparral-filled canyons do so helplessly, unable to see on their own, the advantages of fire-breaks, independent power and water supplies, etc. If enough copies of the December issue get around maybe we won't hear of so many homes and estates going up in smoke.

Ted Hardgrove
Libby, Montana

Much of the western U.S. is arid, chaparral country where wildfire occurs periodically, especially in summer and fall months. We're happy that you can use the information on protecting home and property from this menace.

Food Storage

I have always felt that dried beans and rice make a good staple food. Could you please advise what is the safest way to store them and the maximum length of their

Continued on page 20



Custom Knifemaking
10 Projects from a Master Craftsman
by Tim McCreight
\$14.95, 224 Pages

A professional metalsmith and instructor of metalsmithing takes you along on a project-oriented approach in this unique and practical how-to book. Each project includes a list of materials, a process overview, design considerations, and illustrated step-by-step instructions. Introductory chapters offer an overview of toolmaking (material requirements from the historical perspective, design, sheathmaking, and forging), preparing you for the specific skills you will learn from each project. You get 10 how-to projects in all, from the one-blade pocket knife to the wilderness/survival knife. The information is presented in a project format and illustrated to both enhance and instruct. Whether hobbyist or serious knifecrafter, you will want this guide in your library and hobby shop.

Please send me _____ copies of Custom Knifemaking @ \$14.95 (plus \$2.50 postage for 1st book & 50¢ for additional copies) PA residents add 5%. If not completely satisfied I may return within 30 days in original packing for full refund.

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We decided to put together a package for the highly effective new Israeli Civilian Gas Masks that we have been offering for the past 15 months. We wanted something that was easy to pack and easy to carry. So we have taken a mask which comes with one canister and added a second canister and put them in a heavy-duty used US mask bag. The bag features three small outside pockets that can hold other items such as water tablets, matches, knife, etc. It also has a nice carrying strap that is made so it will not break easily. The bag secures the mask and canisters with two easy-to-open spring snaps.

The Israeli Masks are not only new (meaning they have not been used) but also are of recent manufacture. Made for the Israeli population to protect against gas attacks, they will handle all common battlefield gases including CBW gases. One important feature is that the filter can be changed in seconds without removing the mask. The canisters have no listed limit to shelf life. In talking to those who seem to know, if the protecting seals are not removed they should store indefinitely. Also the filters are readily available at this time. #C/0569

Bag, Mask and 2 Canisters

\$ 29.95 + 3.00 S&H

2 Sets \$ 60.00 ppd.

Bag Alone #6479 \$ 6.95 ppd.

Extra Canisters #6477 \$ 9.50 ppd.

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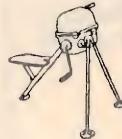
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This coat is currently nationally advertised in mail order catalogs for \$159.95. Rich steel gray/blue fabric, downproof and water-repellant shell, 100% American processed, cleaned, and sanitized Goose Down filling, detachable hood, YKK zipper front with snap-covered overture to cut out all cold, detachable down-filled hood with Velcro™ closer plus draw string, 2 large outside cargo pockets, side zipper glove pocket, and a zippered sleeve pocket, unique side zippers that allow you to get to pant pockets without lifting whole parka, and much more. Rated to 40 degrees below, this is one of the best buys available. Sizes small, medium and large. #0380

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White Stock Lasts \$ 95.00 + 9.00 S&H

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We know it sounds like something out of "Star Wars" but these batteries really store for 20 years or more—and then will give as much or more power as batteries made today. The secret is that until you twist the cap the active ingredients do not mix, so there is no power to be lost in storage. Sorry, they only have D cell size now! #4405

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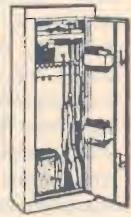
Special \$ 119.95 + 3.50 S&H

2 Stocks \$ 229.95 ppd. 48 states

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\$ 129.95 freight collect

2 Cabinets \$ 229.00 freight collect

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#C/4360

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\$ 395.00 freight collect

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A super special on super products. cans of our famous hash brown potatoes and two cans of military beef steak at another impossible-to-pass-up price. The total retail value of the case is \$165.00 plus 8.75 shipping and handling. Our special price is only \$44.50 plus 8.75 S&H. That is about 22 steaks and 34 pounds of potatoes that will store for years. #C/1416

Potato & Steak Case \$ 44.50 + 8.75 S&H
Limit 4 Per Family

18-Gallon High Quality Barrels Used once—for mushrooms!



These are made of ½" high impact plastic and they are food grade so you can store grains, beans, or water in them. They have a 10" screw-on lid with an airtight seal due to a neoprene gasket. 23" high and 16" in diameter and includes two heavy-duty handles for easy carrying. Good also for burying (even weapons) if care is taken in sealing and packaging. New ones cost about \$29.00 plus shipping—but these are carefully washed and you can get them as low as \$16.50 delivered to your door. They are shipped from Pennsylvania. #0218

18-Gallon Barrel \$ 19.95 + 4.50 S&H

5 Barrels \$ 110.00 ppd. 48 states

10 Barrels \$ 195.00 ppd. 48 states

20 Barrels \$ 345.00 ppd. 48 states

100 Barrels \$ 1650.00 ppd. 48 states

THE FAMILY UNIT WITH REAL FREEZE DRIED MEATS

The Family Unit will provide over 2,300 calories and 70 grams of protein per day for every member of the family for three months. All items are packed in the finest quality heavy-duty double enameled No. 10 cans with nitrogen storage atmosphere for longest possible shelf life. The Unit comes in 24 easy to stack cartons and is the finest three month supply available on the market today. The Family Unit is a high quality, high calorie and high protein supply of storage food for a family of four for three months. It combines the best of air dried and freeze dried foods to do this job.

#C/0555

reg. \$ 2395.00 freight collect

**Special \$ 1125.00 freight collect
2 Units \$ 1995.00 freight collect**

VEGETABLES: 1 cabbage, 2 carrot dices, 2 corn (FD), 2 garden peas, 4 potato granules, 3 potato dices, 1 tomato crystals, 4 green cut beans, 1 celery, 2 potato slices, 1 spinach, 2 stew blend, **FREEZE DRIED MEATS:** 3 hamburger patties, 3 diced beef, 2 beef steak, 2 pork patties, 2 diced chicken, **FRUIT GROUP:** 1 apple dices, 2 apple slices, 1 peach pieces (FD), 3 mixed fruit (FD), 1 raisins, 1 strawberries (FD), **PROTEIN:** 2 eggs with butter (FD), 2 egg solids mix, 1 baking eggs, 12 milk solids, nonfat regular, 1 cheese powder, 1 red beans, 1 white beans, **GRAINS:** 1 corn meal, 2 quick oats, 1 granola, 2 white rice, 30 whole kernel wheat, 2 spaghetti, 6 white flour, 4 cracked wheat, **FATS & OILS:** 2 butter powder, 4 shortening powder, **ADJUNCTS:** 2 iodized salt, 1 cocoa, 1 orange drink, 1 bacon dices, 1 strawberry gelatin, 1 sour cream powder, 18 sugar.



This is a newly designed supply that came out of the chaos of the disaster in Mexico. I felt a need for an inexpensive highly-portable package that would provide a minimum supply of food, light, heat and shelter for one person for seven days or two people for three days. The supply includes: high quality tube tent, two space blankets, stove and fuel, eight candles (about 40 hours of light), water tablets, waterproof matches, first aid kit and a high quality supply of military food pouches. The food supply contains 21 retort pouches of meat entrees, 14 cakes, 14 fruit bars, 7 beans with tomato sauce, 7 candy bars and 7 heavy plastic spoons. All these products are fully cooked. All you need to add from the store is a good transistor radio and some water and you can be prepared for the 72 hours it takes to get most government emergency programs in place. #C/0591

**Special \$ 49.95 + 9.50 S&H
3 Supplies \$ 145.00 + 15.00 S&H**

Freeze Dried Food Grab Bag \$150 Worth of Food for \$48

With Mountain House basically getting out of the emergency food business by cutting their line so far, it does not make sense to even offer their products. Therefore, we will offer you a grab bag of six cans of top quality freeze dried foods—four No. 10 cans and two 2½ size cans—at a very special price. This will include real meats, fruits, vegetables, and desserts. Now you all know that freeze dried foods cost much more per can than air dried foods—especially meats, so we cannot sell the grab bag for \$18.50. But we will guarantee that each Grab Bag contains at least \$150.00 retail value of food. This means you will save at least 66% on the retail prices. All will be canned for the longest possible storage. #FGB1

**Freeze Dried Grab Bag \$ 48.00 + 7.25 S&H
3 Bags (18 cans) \$ 129.00 + 20.00 S&H
5 Bags (30 cans) \$ 200.00 + 30.00 S&H**

Bill's Special Meat Pack AT DISTRIBUTOR'S PRICES

I am offering a great 18-can freeze dried meat pack at distributor's prices. All are in heavy-duty No. 10 cans, all have storage atmosphere and all are new products. Some of the product is from Mountain House, some is Country Cupboard, and some is our military cosmetic reject meats. All are great tasting and there are over 350 servings of easy-to-prepare meat. 18 cans in all, packed in three easy-to-store cases. Includes: 4 beef steak, 3 hamburger patties, 3 chicken, 1 turkey, 3 pork sausage patties, 3 diced beef, and 1 ground beef.

#0568 reg. \$ 845.00 + 25.00 S&H
Special \$ 355.00 + 25.00 S&H

Air Dried Food Grab Bag

Guaranteed Savings Of At Least 65%

We just bought 5000 assorted cans of high quality air dried products from a company that found it is not easy to make a success out of "survival." These products include fruits, vegetables, grains, protein and adjunct items and are in either heavy-duty No. 10 or 2½ size cans. All were canned in the last 18 to 20 months and as you know that is about no time at all for air-dried products.

We are selling these products in 6-can grab bags. Each bag will contain a combination of six cans of food—three will be No. 10 and three will be 2½ size cans. We had no choice of what we got and so neither do you—however, we will guarantee that each case will contain a minimum of \$52.00 worth of high quality food and can contain up to \$80.00 worth. This means you will save at least 65% on this special. #AGB1

Grab Bag \$ 18.50 + 9.50 S&H

5 Bags (30 cans) \$ 85.00 freight collect

10 Bags (60 cans) \$ 149.00 freight collect

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PHONE _____ TOTAL _____

NEW PRODUCTS



Earthworks Tipi

Go camping the traditional way with a tipi from Earthworks Tipis of Ridgway, Colorado. Constructed of canvas and other materials, these tipis are designed to give years of dependable use. They are patterned after the three-pole Sioux design and have a tall, slender shape with elongated Cheyenne-style smoke flaps. The preshrunk army duck canvas is treated to repel water and is mildew resistant and available with a fire retardant treatment. All Earthworks tipis feature buffalo hide reinforcing, come in several sizes with a complete line of accessories. For information on how to obtain one, contact Earthworks Tipis, Dept. ASG, Emma Kigar, P.O. Box 28, 604 Clinton, Ridgway, CO 81432; phone (303) 626-5680.



Extra Ammo

The new, patented DeSantis Ammo Rac was designed for anyone who needs to carry backup ammunition for both rifle and sidearm at the same time. Made of top grain cowhide, the Rac fits on belts up to 2 inches wide. Available in standard and large loop models, the standard loops hold 12 .38/.357 Magnum cartridges and the large loops hold 10 .44 Magnum cartridges over 10 .30-06 type cartridges. The Ammo Rac measures 6½ inches wide by 4 inches high. It is available in tan only and costs \$24.95 retail. To obtain a 20-page full color DeSantis catalog featuring holsters for belt, shoulder and ankle, slings, belts and a wide variety of accessories, mail \$2 to DeSantis Holster, 155 Jericho Turnpike, Dept. ASG, Mineola, NY 11501.



PacLite

PacLite Instrument Cases announces the PacLite line of accessory kits for use with the Mini-Mag and Tekna mini-flashlights. The kits include a custom fitted case, a set of filters, lanyard and a spare bulb and battery container. The cases have DuPont Cordura outer shells and UniRoyal Ensolite padding. All seams are double stitched with mildew-resistant thread, and all edges are covered with nylon trim for added protection. PacLite also provides storage compartments for flashlight, filters, and lanyard, in addition to special waterproof containers for spare bulbs and batteries. The velcro closure, two-inch belt loop and top quality materials used in construction make them easy to attach, simple to use and durable. PacLite cases are currently available to fit Mag Instruments' Mini-Mag, Tekna Products' Mini and Micro series and Aquacraft's Aqualume System II. They may be purchased with or without flashlight for a suggested retail of \$13.95 to \$29.95. Direct inquiries to PacLite Instrument Cases, Dept. ASG, 618 Elvira Ave., Suite B, Redondo Beach, CA 90277; phone (800) 582-2255 toll free, or (213) 316-2886 in California.



Stick Pen

Knife maker Pat Crawford's latest concealment knife is the Stick Pen, a knife disguised as a fountain pen. The blade is hand ground from 440C stainless steel, heat treated and mirror polished and hand

fitted into the case. The blade has a razor sharp cutting edge on it. The pen case is brass and comes with an 18K gold plate for \$100 or chrome and antique finish for \$75. For details, contact Pat Crawford, Dept. ASG, 205 N. Center, West Memphis, AR 72301; phone (501) 735-4632. Send \$3 for Pat Crawford's catalog of custom-made knives.



Home Filtration

The AcquaBrite Bacteriostatic Granular Activated Carbon Filter system for home water filtration is available from Amsoil Inc., Amsoil Building, Dept. ASG, Superior, WI 54880. AcquaBrite improves the taste and quality of drinking water by eliminating or substantially reducing chlorine, many organic chemicals, pesticides, herbicides, mercury, sulfur compounds, bad taste, bad odor, rust and sediment from tap water. The AcquaBrite filter is available in several models. All models have replaceable filtering cartridges to ensure continual protection. The countertop model attaches to the water faucet and provides a year of filtering protection for an average family. An undercounter model offers two years of filtering protection and comes complete with its own faucet. A third model is available for automatic ice-cube makers. Suggested prices for the AcquaBrite family of filters are: Commercial/High Volume AcquaBrite, \$298.95; Countertop AcquaBrite, \$129.95; Refrigerator Ice-Maker AcquaBrite, \$64.95; Undercounter AcquaBrite, \$144.95; and Fluoride/Arsenic Filter (installed in series with the undercounter AcquaBrite), \$225.95. Amsoil can provide more information.



Pocket Zapper

The new Stun Gun Pocket Zapper packs 26,000 volts of self-defense wallop in a 4-by 2-inch unit. The 26,000-volt "zap" is low amperage. It cannot cause side effects or damage, even if the attacker has a heart condition. The current cannot be transferred to the user, even if he or she is touching the attacker. The Pocket Zapper is easily hand held or carried in purse or pocket. A built-in clip lets user wear it like a pocket pager on a belt, pants or running shorts. The Pocket Zapper is made of black Cyclocac "football helmet material" for durability. An ordinary 9-volt battery delivers over 100 full-power blasts. Total weight with battery is 4.4 ounces. The Pocket Zapper with battery, instructions and money back guaranty is \$45 postpaid from TCM Corp. Dept. ASG, P.O. Box 2019, Aptos, CA 95001-2019.



Precision Swaging

For those who want the quality and features that make a superior or unique bullet, Bob Bryant of Precision Swaged Bullets, Rt. 1, Box 93 H, Dept. ASG, Ronan, MT 59864; phone (406) 676-5135, is offering a line of custom bullets individually swaged in a Corbin Hydro-press die set. Each component is hand-fed and inspected during each stage of forming, thus insuring that there is no chance of an inferior bullet slipping through as with automatic machinery. Precision Swaged Bullets makes a variety of 7 mm rebated boat tail jacketed bullets ranging

in price from \$13.48 to \$19 per 100; and .429 caliber cup base round nose, round nose/flat nose with flat or cup base, and round nose/flat nose flat base bullets ranging from \$17.38 to \$19.50 per 100. Also available are caliber .395 round nose flat base paper patch bullets of variable length and weight; .449 semi-spitzer cup base paper patch bullets of variable length and weight; and .505 round nose cup base paper patch bullets of variable length and weight. They are not sold patched. These bullets are sold according to weights ranging from 300 to 700 grains and range in price from \$14.50 to \$16 per 100. A 10 percent discount is given on all orders totaling more than \$50 and a 20 percent discount for orders over \$125. All orders must be paid by certified check or money order and are sent UPS or freight collect.



Riot Gas Mask

The new Riot Facelet (RF) CN/CS Gas Mask, developed by the British Ministry of Defense for the British Army, is now being imported by Adventure Specialists, maker of anti-terrorist tactical products. The mask has been adapted for law enforcement and security team use to protect against CN/CS tear gases, smoke, and noxious odors such as those from decomposing bodies or industrial wastes. The mask is lightweight. Retailing for \$44.99, the RF mask is packaged with its own separate goggles (gas-sealed, anti-fog, shatter-resistant) in a single poly bag with complete instructions. The RF set may be used up to 20 times before discarding the mask portion. The goggles may be reused indefinitely. The mask is small enough to fit in

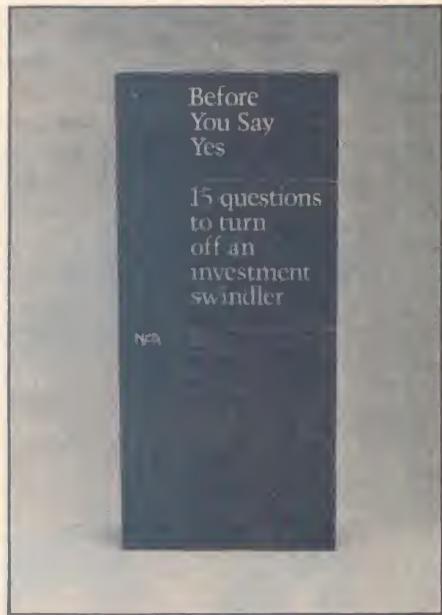
the glove compartment of a patrol car or the pocket of BDUs, a man's breast pocket or woman's purse. For more information, contact Adventure Specialists, Dept. ASG, 1821 N.E. 146th St., Miami, FL 33181; phone (305) 984-6020.



Desert Eagle Accessories

The renowned Israel Military Industries Desert Eagle .357 Magnum gas operated semiautomatic pistol is now available with different finishes, a new conversion kit and several new accessories. Stainless steel, polished and blued, satin nickel and bright chrome are the new choices shooters have for their Desert Eagle. Standard production line Desert Eagle pistols have a black oxide "parkerized" finish. The suggested price of the standard model has just been reduced to \$549 from \$749. The stainless model is \$599 and the other finishes are available custom ordered for \$189.95. Shooters can now customize this pistol in a few more ways: with a trigger adjustable for creep and pull weight; with adjustable sights with either white or orange front ramps; and with a full line of holsters—hip and shoulder—in a choice of black or camouflage Cordura or in black or cordovan leather. Additionally, all current production models of the Desert Eagle will be convertible to .44 Magnum with a kit consisting of a barrel, bolt, slide and magazine. For more information, contact Magnum Research, Inc., Dept. ASG, 7271 Commerce Circle West, Minneapolis, MN 55432; phone (612) 574-1868. ●

BOOK REVIEWS



Before You Say Yes: 15 Questions To Turn Off an Investment Swindler, by the Commodity Futures Trading Commission and the National Futures Association; free from the Consumer Information Center, Dept. 614N, Pueblo, CO 81009.

Nutrition and Your Health: Dietary Guidelines for Americans, by the U.S. Department of Agriculture and Department of Health and Human Service; free from the federal Consumer Information Center, Dept. 622N, Pueblo, CO 81009.

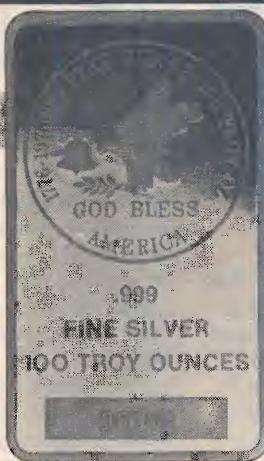
In any business transaction, especially one involving a sizable investment on your part, you have the right to ask questions. You also have the right to say "No." The investment swindler wants to keep you from asking questions and will ask you questions designed to make you say "Yes." To help you know what questions to ask and to recognize a swindler, the Commodity Futures Trading Association and the National Futures Association put together *15 Questions* which is free from the federal Consumer Information Center. "Be aware that investment swindlers are strong-willed, smooth-talking, persuasive individuals who attempt to overwhelm their targets," the pamphlet's introduction states. "Losses to fraudulent investment schemes total in the hundreds of millions of dollars each year. To avoid becoming a part of this year's statistics, ask the kinds of questions that swindlers *don't want to hear.*" Nutrition can be confusing these days with all the informations—some of it conflicting—about what's good for you. *Nutrition and Your Health* offers clear advice in one concise, easy to read booklet to help you improve your eating habits. It provides detailed explanations of five basic dietary rules to follow for better health and longer life.

Continued on page 16

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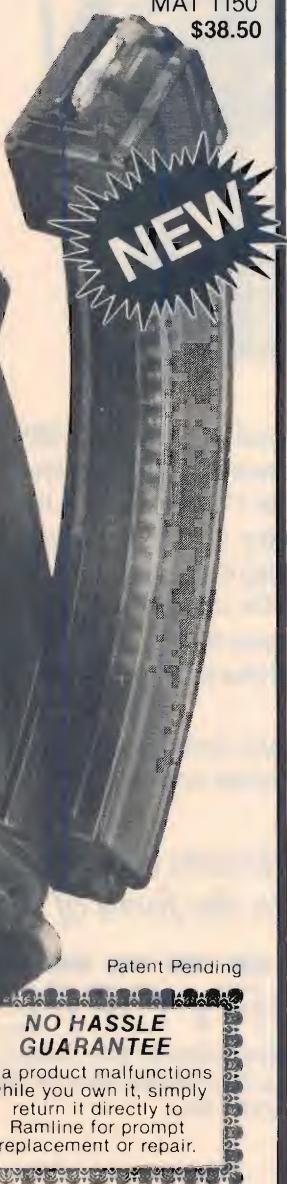
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BOOK REVIEWS

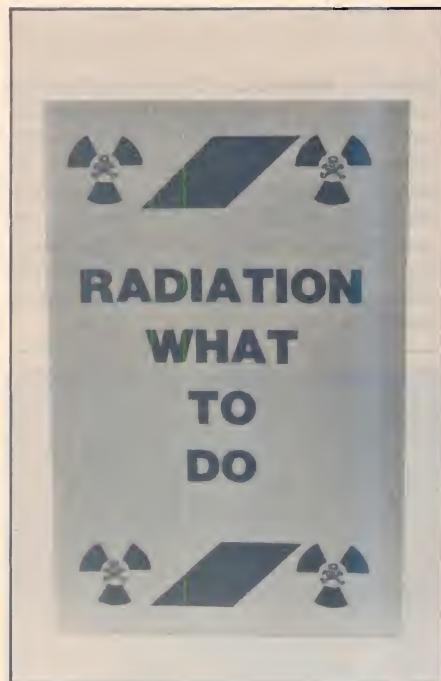
Continued from page 14

COMBAT SKILLS OF THE FIGHTING SOLDIER

Combat Skills of the Fighting Soldier;
Paladin Press, Dept. ASG, P.O. Box 1307,
Boulder, CO 80306; phone (303) 443-7250;
230 pages, paperback; \$10 plus \$3 postage
and handling.

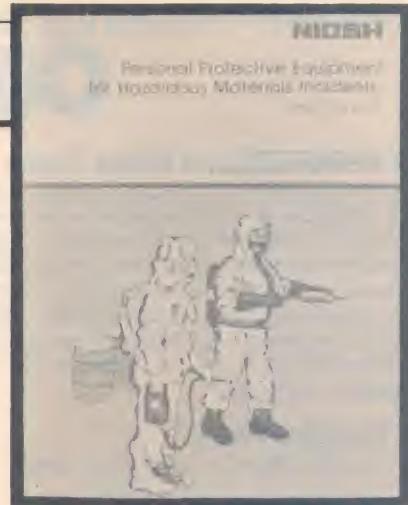
This complete reproduction of the U.S. Army's Field Manual No. 21-75, the soldier's field manual, tells the soldier how to perform combat skills needed to survive on the battlefield. These are the basic skills that must be learned by soldiers in all military occupational specialties. Well illustrated chapters and appendices explain and instruct on cover, concealment and camouflage, fighting positions, movement, observation, nuclear, biological and chemical warfare, combat intelligence and counterintelligence, communications, first aid and personal hygiene, mines, demolitions, obstacles, urban area operations, tracking, survival, evasion and escape, weapons and fire control, field expedient antitank devices, and range cards. The manual provides a fascinating look at military combat infantry training techniques and tactics as well as weaponry and other equipment.

**SUPPORT
American
Survival
Guide**



Radiation: What To Do, by David Richard Cox; Rad Pro Inc., Route 2, Box 258, Central, SC 29630; 26 pages, paperback, \$5 postpaid.

The U.S. government does not provide a civil defense radiation protection program for the public. Other countries, primarily communist ones, do have radiation programs and adequate fallout shelters, supplies and facilities. This instruction booklet gives you the information necessary to establish a radiation protection program in your own home. It tells you what the radiation limits are and explains the biological effects of radiation. Covered is atomic mass theory, contamination and radiation, protective clothing and how to use it, air samples, radiation surveys, radiation detection instruments, findings of epidemiological studies of cancer in irradiated populations, radiation exposure levels in different cities, and much more. The booklet packs a lot of information into limited space and could be a handy reference as well as a primer on radiation safety.



Personal Protective Equipment for Hazardous Materials Incidents: A Selection Guide, by the National Institute for Occupational Safety and Health (NIOSH); Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402; 227 pages, paperback; \$7.

The book is intended to provide guidance in the selection of personal protective equipment for use by individual workers and organizations involved in control and cleanup of hazardous materials. Although

Continued on page 18

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This multipurpose tool is ideal for campers, backpackers, vacationers, or kitchen use. Six interchangeable blades lock firmly into the comfortable rosewood handle, and will not break away even during the toughest cutting jobs. The entire kit folds up into one handy vinyl case. Blades included are: a carving blade, a saw for wood and bone, a serrated bread knife, a frozen food blade, a boning blade and a deep cook's blade for dicing, slicing, and carving. Overall length: 13 1/2", cutting length of blades: 7 1/4". Vinyl case 10" x 2 1/4" x 1 1/4". Wt. 16 oz. \$29.95 + \$4.00 UPS



"Freedom Pack"

This small backpack is seeing a lot of action in Nicaragua, thus the name "Freedom Pack". Designed for mobility, this pack has many of the features and all of the quality of the G.I. Alice Pack, only smaller. Features: heavy olive drab nylon cloth, hand carrying strap, attached suspenders, cargo loops on bottom and sides.

Regular \$31.95 + \$3 UPS

Special thru 3/15/86:

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Five Gallon Water Storage Containers

These high quality 5 gallon containers were used once to transport concentrated lemon juice. They are made of high-impact plastic and are food grade. They are beige, rectangular, vented and have an easy carrying handle. They are formed to stack easily. If unused these would sell for \$14.95.

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One: \$9.95 + \$2.50 UPS

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5 for \$30.00 + \$9.25 UPS

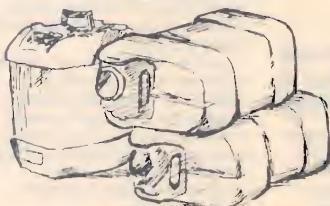
12 for \$60.00 + \$22.00 UPS

50 for \$210

FREIGHT COLLECT

Spigots \$2.50 each

3 for \$6.00



Israeli Army Commando Sleeping Bag

Brand new Israeli Commando Sleeping Bag features 48 ounces of high quality polyfill, a 100% waterproof polyurethane underside, water resistant upper material and 100% cotton lining. It is a modified mummy style with a full zipper that allows two bags to be easily zipped together. The hood has a pillow attached in it and the whole bag rolls up into the built-in hood. Rated good to 10° F. These are a \$120.00 commercial value. Size 80" x 28", weight 5 1/2 lbs., color Olive Drab.

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Mountain Operations

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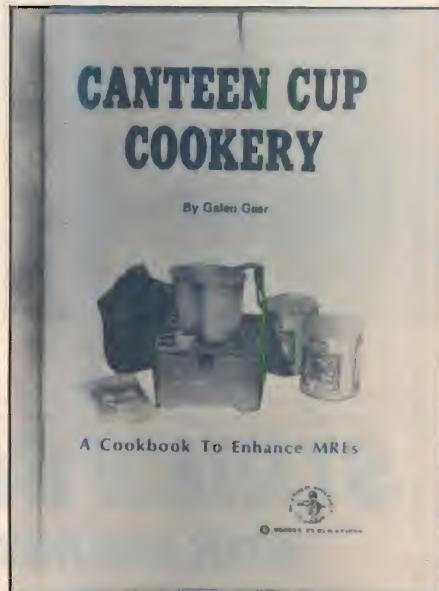
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BOOK REVIEW

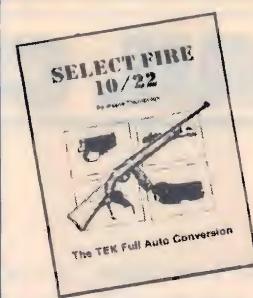
Continued from page 17

geared to the needs of the professionals in toxic waste management and somewhat technical, this guide could be consulted by those private parties who wish to select the proper equipment for protection from hazardous materials. The book discusses the requirements under specific circumstances for protective clothing, respirators and other equipment, what it does and how it should be used.



Canteen Cup Cookery, by Galen Geer; Desert Publications, Cornville, AZ 86325; order from MRE Cookbook, P.O. Box 175, Florence, CO 81226; 45 pages, paperback, \$5.95 postpaid.

This book is a cookbook for service men and women who want more out of their field rations than what the government planners were able to come up with. Because the new rations are so much like civilian counterpart meals, the book can be used by civilians who have never seen a "Meal Ready to Eat" (MRE). *Canteen Cup Cookery* offers quick and easy recipes for seven sauces, four kinds of soup, four cake icings, three fancy gravies, six sweet desserts and 18 main course meals, besides instructions on preparing basic meals without a mess or fuss. Also covered is information on how the meals are packaged and a complete listing of the contents of each meal pouch to take the guesswork out of what is in the pouch. This book, by a former U.S. Marine and respected survival writer, could be used by anyone who spends time outdoors, whether eating civilian or military prepared foods. ●



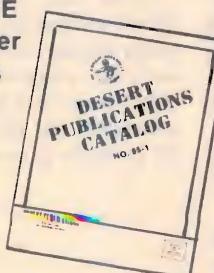
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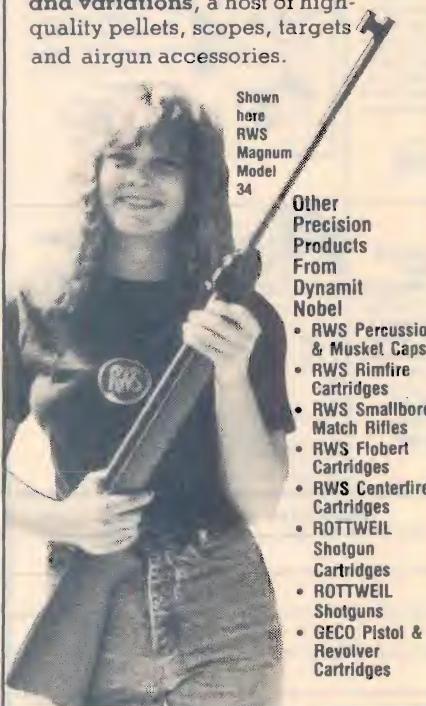
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MAIL CALL

Continued from page 9

shelf life? My husband and I are rather new subscribers to your magazine and maybe this information has been available in your magazine in the past. So, we would certainly appreciate any information you can give us. We truly enjoy reading *ASG* and plan to make our copies part of our library.

Marlene Mingo
Utopia, Texas

You probably mailed this letter shortly before receiving our December issue with an article on bulk food storage. We refer you to that article for more information, and we'll be running other material from time to time on this subject. In that article three simple methods of long-term bulk food storage are briefly explained: use of dry ice, desiccant and bay leaves. There are also a number of books available on the subject. The author states that, "Dried beans, peas and certain grains such as corn will store for years with little worry about spoilage or insect damage . . . Rice is best stored if the long grain variety is purchased for the fat content in the short grain variety can make it go rancid within a year. Polished or white rice keeps longest but has been stripped of its nutritional hull in processing."

Blooper

After reading your glowing reports of Survivalist Clearing House I sent them a check for the \$8 catalog. After reading it I found it to be grossly over priced and not having anything really different from the open market. I can find most of the items advertised readily in gun shows and the *Shotgun News* as well as your magazine at more than half the price shown in their catalog. Consultation fees of \$120 an hour? The President of the U.S.A. doesn't make that much. I wonder how the other advertisers in your magazine feel for you to give this company such an endorsement when they really don't seem to be anything but an over priced outfit. An endorsement of a company like this makes me question your other comments.

Robert L. Kienietz
Canon City, Colorado

We're glad you wrote about this since it gives us the opportunity to explain an embarrassing blooper that occurred. First off, we disagree with your assessment of Survivalist Clearing House. Of course they

are an advertiser, but we do believe they have a fairly wide ranging selection of survival equipment and are worth looking over. If you can get the same items cheaper elsewhere, good for you. Now for the blooper. Survivalist Clearing House had a four-page advertisement in the December 1985 issue of *ASG* which followed our survival catalogs article (including information on Survivalist Clearing House) in the November 1985 issue. This firm presented us with ad copy that looked almost exactly like one of our regular editorial articles. We accepted the ad but insisted on marking the top of each page with the word "advertisement." This was done and we shipped this issue to our printer in the Midwest. Then there was some kind of foul-up with the printer which we still don't understand, but the result was that the printer removed the "advertisement" marking at the top of each page of the ad. Let us state clearly here that pages 39 through 42 of the December 1985 issue of *ASG* are an advertisement and were intended as an advertisement.

More On Catalogs

I am writing to let you know what a fine publication you have. I have and read every issue you have published. I've read and studied your magazine very well. I have learned a lot. I pray you will never cease your writings. I will then lose a friend. You have put out many fine issues, really! I have put off writing you several times, but with the world beginning to be in turmoil more every day, and with your last issue, November 1985, with the addresses of survival catalogs, and the beautiful front cover, I finally had to write you to say thank you. "See ya" in the next issue.

John Stephenson
Bristol, Indiana

Glad you like the magazine, John. We're a relatively small operation, though many people contribute to our publication, and, like every human endeavor, we have our failings and faults. But we are striving constantly for improvement. Our readers let us know if we are succeeding. •

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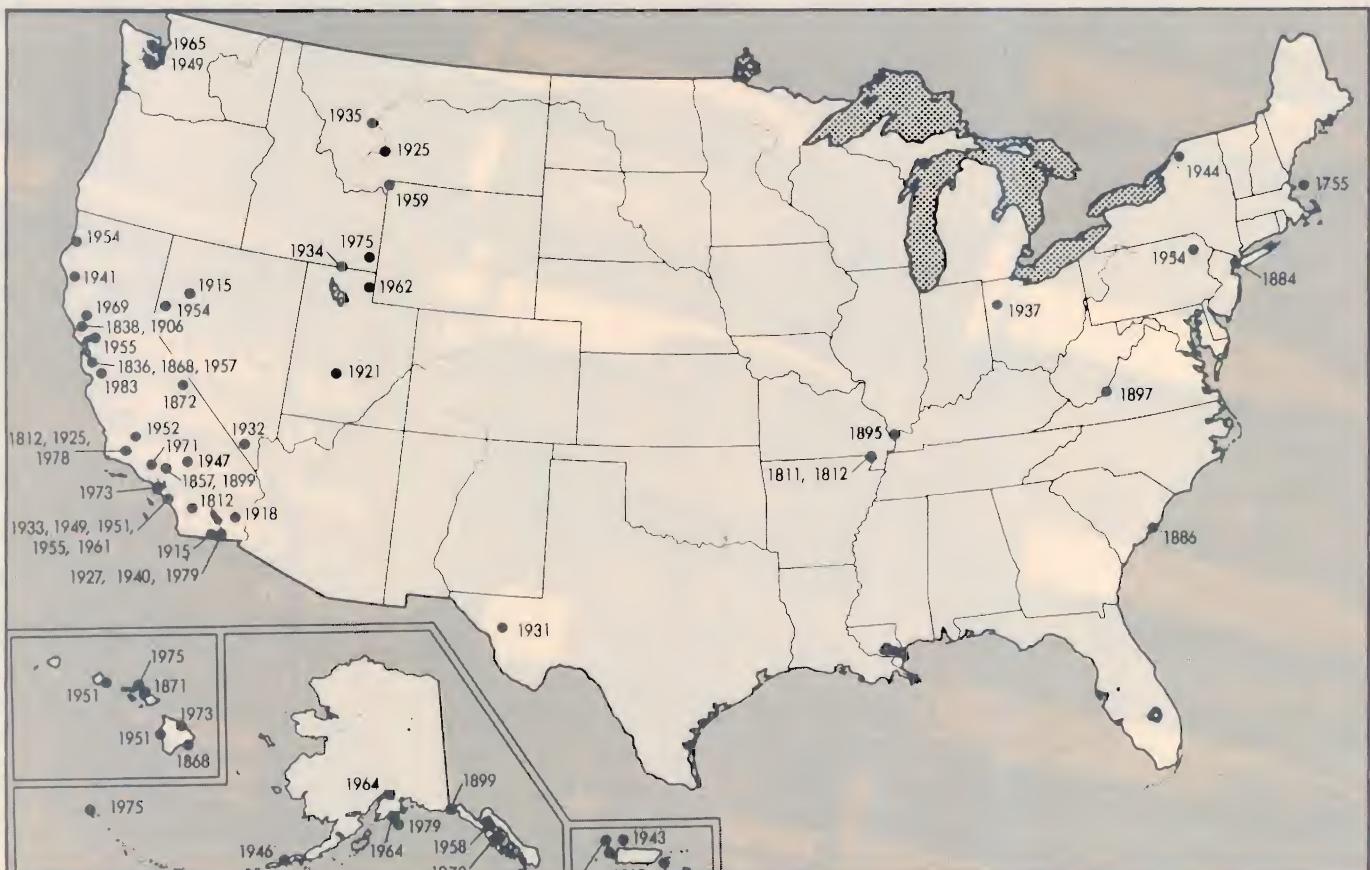
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The Great Shake:

NEW MADRID

Some authorities believe that 175 years ago this area of southeastern Missouri was the site of the world's largest earthquake since prehistoric times . . .

By John Galey



Historic damaging earthquakes in the U.S. have rocked many different states but the main clusters are in the West, far from the New Madrid seismological zone (Source: U.S. Geological Survey).

THE BIGGEST EARTHQUAKE in the United States . . . will it happen in California? Possibly but not likely. Mention earthquakes and many people invariably think of this state with its disastrous San Francisco quake of 1906 and the related San Andreas Fault which makes California a highly earthquake-prone region. But few realize the most probable location for the nation's biggest quake actually lies far to the east. Named for an obscure small town in southeastern Missouri, the New Madrid Fault could prompt the greatest natural disaster in U.S. history.

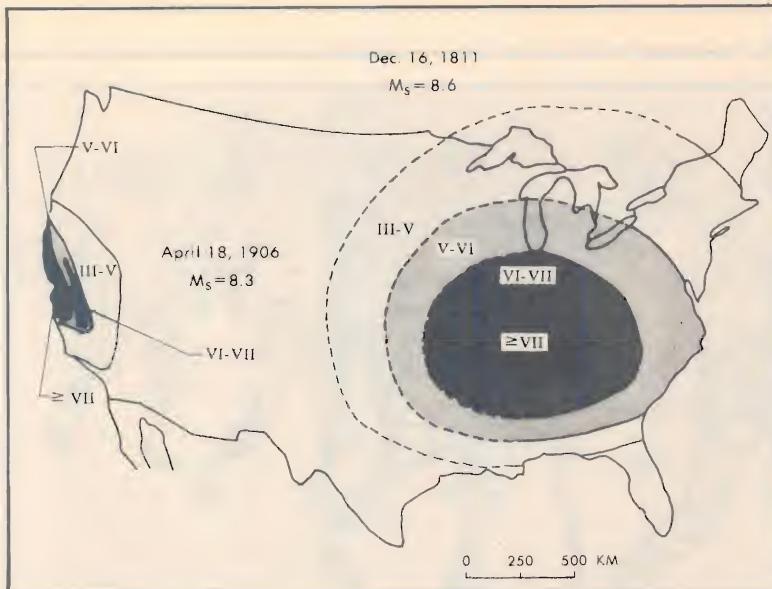
Some authorities agree that 175 years ago, the New Madrid region was the location of the world's largest earthquake since

prehistoric times. The main tremors and aftershocks shook an area of approximately one million square miles, and likely reached an intensity of 8.5 (Modified Mercali Scale) over 2.5 million square kilometers. The epicenter was in northeastern Arkansas; the area of principal disturbance also included southeastern Missouri and northwestern Tennessee.

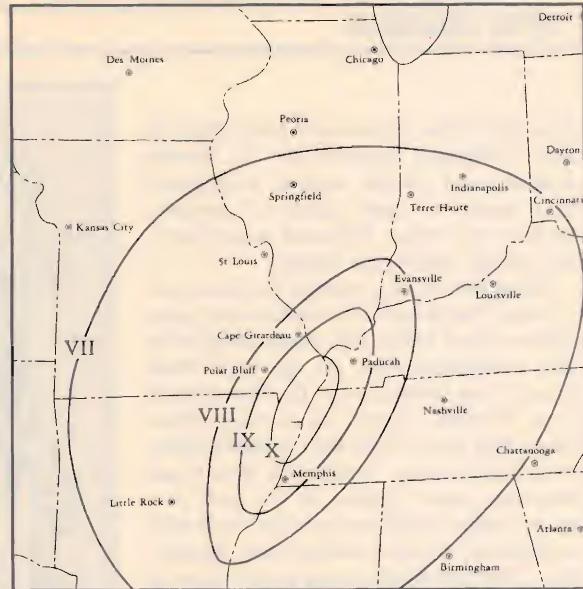
During a cruel winter from Dec. 16, 1811 to March 16, 1812, the major intensity zone may have suffered over 1,800 shocks. Their number and intensity are debatable, for no instruments existed to measure the tremors, but three great quakes likely reached an estimated 8.6, 8.4 and 8.7 on the Richter scale. Geographically, the damage zone was 15 times

greater than that of the 1906 San Francisco quake. The New Madrid shocks rang bells in Richmond, Virginia, and made people totter in Charleston, South Carolina. They were felt in Washington, D.C., over 750 miles away and in New Orleans, Louisiana, far to the south. The tremors even shook up Ontario, Canada.

The earthquakes' focus is usually associated with the tiny Mississippi River settlement of New Madrid because in 1811 this town of 3,000 people was the only population center of any consequence near the epicenter. At the time, the major intensity zone consisted mostly of pasture land and wilderness. Thus the staggering series of quakes caused surprisingly few casualties. No accurate records exist but



A comparison of the isoseismal contours for the 1811-1812 New Madrid and the 1906 San Francisco earthquakes shows the vastly greater intensity of the Mid-western events. The New Madrid quakes were felt over almost 1 million square miles and resulted in damage ranging from minor structural and architectural destruction (Modified Mercali intensity VII) to total destruction (MM intensity X to XII). By comparison, the San Francisco quake was felt over 60,000 square miles (Source: U.S. Geological Survey).



The oval lines depict the location of cities in the central U.S. relative to isoseismals matching a reoccurrence of the great New Madrid earthquakes. Modified Mercali intensities of VIII would cause structural damage. Architectural damage would result from MM intensities of VII (Source: U.S. Geological Survey).

judging from contemporary accounts, it's likely that less than 100 people died and most of these drowned in the Mississippi. The quakes did eventually destroy the town of New Madrid.

They also drastically altered the geography of a vast region. Fissures ripped the earth, spewing up sulphur and big chunks of coal. As widespread areas of subsoil liquified, the land sank permanently in parts of Arkansas, Missouri and Tennessee. Along the Mississippi, thousands of acres of river banks collapsed in segments as large as 40 acres at a time. This produced enormous swells with tidal wave effects. For people on the river, this probably gave the impression that the Mississippi "ran backwards" for a short period. As the earth rolled like an ocean, acres of forest plummeted into the river, leaving navigation hazards that persisted for many decades. River islands, up to several miles long, disappeared forever beneath the water. The Mississippi's bed erupted in sand blows that left deep craters, and risings in the bed created steep falls.

The quakes' alterations also greatly enlarged Reelfoot Lake in Tennessee. Meanwhile in North Carolina a newly formed volcano gushed lava for nearly a mile.

Terrifying Noise—As one observer described the quakes, "The noise was **terrifying and loud** like a thousand cannons, and the earth shook and tottered so that no man could stand on it." "Everywhere," added another alarmed witness, "Nature itself seemed tottering on the

verge of dissolution."

Adding to the havoc were the cries of terrified wildfowl and other wild animals around New Madrid. In one bizarre incident, bears, wolves and deer sought shelter in a settler's yard; they neither feared each other nor man, but they were obviously panicked by the violent tremors.

The earthquakes' extensive damage to the land prompted the U.S. Congress to pass the nation's first disaster relief act. Legislation in 1815 provided landowners of ravaged ground with an equal amount of territory in unaffected areas.

The relatively quiet interims in the New Madrid region after 1812 were consistent with the theory that after a major release of accumulated pressure under the earth's surface, no extremely violent tremors will recur for decades in an earthquake-prone area. Moderate to large quakes shook the Mississippi Valley in 1843 and 1895. The latter quake registered 6.0 (Richter scale) and shook buildings in St. Louis. In 1976 a quake registering 5 originated at Marked Tree, Arkansas, and was felt in seven states. Four years later, a quake registering 5.1 caused over \$1 million damage in several Kentucky counties.

Today, the area affected by the New Madrid Fault and rift system experiences microearthquakes every several days. Many of these tremors are so slight that only seismological instruments can detect them. Still, their frequent occurrence seems like an ominous reminder of what might occur again.

Quake Research—Earth scientists admit they have much to learn about the

New Madrid seismological zone and about the causes of earthquakes in general. One could argue that scientists now know more about the far reaches of outer space than they know about what's happening 5 to 20 kilometers beneath the earth's surface where major faulting often begins. But since the 1960s major advances in the study of earthquakes have been made partly because of intensive research in the related fields of petroleum exploration and the monitoring of underground nuclear explosions.

One revolutionary aspect of seismological research since the 1960s is the widely accepted theory of "plate tectonics" (moving plates). According to this theory, the earth's lithosphere (rigid outer layer) consists of various plates about 100 kilometers thick. Seven major plates cover the world's continents and ocean basins. Moved by forces in the earth's molten interior, these titanic plates shift ponderously as they ride on a lower layer of soft rock. Continental perimeters, island chains and ocean ridges bound the plates; these border areas undergo tremendous accumulated strains which are temporarily relieved by earthquakes. This accounts for the well defined earthquake belts, including the U.S. West Coast, that girdle the earth.

More than 90 percent of the seismic energy released from plate tectonics originates on continental coastlines and island chain perimeters. Only about five percent of the world's earthquakes occur in mid plate zones such as the U.S. Midwest. The New Madrid seismological zone is thus a maverick, and its origins are still ►

NEW MADRID

debatable. One explanation holds that the zone undergoes pressure by the distant Atlantic and Pacific seismic movements that create a ripple effect of massive, backed-up energy. Released periodically, this energy creates the quakes.

Other factors also account for the zone's unusual characteristics which make earthquakes there potentially more destructive and widespread than on the U.S. West Coast. Rock formations in the New Madrid zone transmit energy much more effectively than those in the west, which absorbs more of the energy. Unlike the West Coast situation, major quakes in the zone produce massive liquification of the earth with consequent surface sinking and destruction. The New Madrid area is also prone to much more numerous and prolonged aftershocks than the West Coast.

Moreover, the New Madrid zone's fault system lies hidden far behind the earth's surface. This complicates scientific investigations. In contrast, the San Andreas Fault and offshoots are relatively visible and measurable.

Systematic seismological readings have begun to unravel some of the mysteries of New Madrid. Beginning in 1974, St. Louis University's Observatory, cooperating with the U.S. Geological Survey (USGS), installed the first network of seismic measuring instruments in the New Madrid zone. Five years later, Memphis State University's Tennessee Earthquake Information Center introduced the second network. The zone is now monitored 24 hours per day, and technicians can now accurately pinpoint the location of any quake down to a magnitude of 1.0 on the Richter scale.

Beginning in the early 1980s, the Federal Emergency Management Agency (FEMA) headed an ongoing five-year earthquake study and preparedness plan for the Mississippi Valley. This fits within the scope of the national Earthquake Hazards Reduction Act of 1977. The five-year plan is a sophisticated, multidisciplinary, and integrated approach by FEMA, the USGS, the Nuclear Regulatory Commission, and the Army Corps of Engineers, as well as scientific and business communities, private agencies and political representatives on all governmental levels in the New Madrid zone. The project has projected that a major quake would affect areas of 21 states. The potential high impact region includes seven states with about 33,000,000 people; 15 percent of the U.S.'s total employment; and 19 percent of the nation's manufacturing. The region also has facilities critical to national security.

One FEMA study surveys potential damage in six cities: Little Rock (pop. 158,000), Arkansas; Poplar Bluff (17,000), Missouri; Evansville (130,000), Indiana;



Religious fanatics were among the settlers of New Madrid. After the great quakes, their jeremiads claimed the destruction was God's punishment for a sinful humanity (Source: *Western Lands and Western Waters* (1864) in the State Historical Society of Missouri, Columbia, Missouri).



This woodcut shows the effects of the New Madrid earthquakes on the Mississippi River which rose in tidal waves that drowned boatmen (Source: *Our First Century: One Hundred Great and Memorable Events* (1877) in the State Historical Society of Missouri).

Paducah (32,000), Kentucky; Carbondale (27,000), Illinois; and Memphis (646,000), Tennessee. Of these, Memphis ranks as the most vulnerable because it's built on highly unstable sediments, and the city doesn't enforce seismic codes in construction. One prediction for Memphis states that if a major quake struck in 1990, it would cause nearly 3,000 deaths along with 10,000 serious injuries, and property damage exceeding \$1.6 billion (1984 dollars). Overall in the New Madrid zone, a great quake would destroy \$36 billion in property, and it would require the relocation of about 400,000 people.

One of the foremost authorities on the New Madrid zone, Prof. Otto Nuttli of St. Louis University, warns that a big earthquake would affect one half the U.S. In a worst possible scenario, he asserts that the destruction and havoc would be exceeded only by the results of nuclear war. Tens of thousands of people would die. A 5,000 square mile area would experience severe damage to most structures; serious damage would cover 50,000 square miles, and moderate damage (collapsed chimneys, falling ceilings, overturned appliances, etc.) would spread over 500,000 square

Continued on page 66

Study:

EARTHQUAKE!

The lives and property of 70 million Americans are at risk . . .

By Jim Benson

PHOTOS COURTESY OF U.S. GEOLOGICAL SURVEY

(Information for this article and the following article "What To Do" was drawn from materials provided by the Department of the Interior's U.S. Geological Survey, the Federal Emergency Management Agency, American Red Cross and Los Angeles Department of Building and Safety—The editors.)



ABOVE—The San Andreas Fault is clearly visible in the Carrizo Plain area of central California.

LEFT—A stream course is offset by the San Andreas Fault in central California.

LARGE, POWERFUL EARTHQUAKES with the potential to kill and injure people and destroy or damage property occur periodically in many areas of the United States and the world.

Earthquakes have probably been occurring for billions of years, playing a major role in the shaping of the earth's surface. Today, most earthquakes happen in areas bordering the Pacific Ocean, which are also prone to volcanic activity, known as

the "ring of fire," and in the Eurasian and Mediterranean regions.

It is estimated that the lives and property of 70 million or more Americans in 39 states and the territories are at risk from earthquakes. The potential for damage is not confined to those areas on fault lines. Severe earthquakes have been experienced in seven widely separated states and the areas affected have included large surrounding regions. Federal authorities say

earthquakes threaten the U.S. with potential annual losses approaching \$1 billion.

Large parts of the western U.S. are known to be particularly vulnerable to quakes. The State of California and its famous San Andreas Fault, which is more than 800 miles long and at least 10 miles deep, is considered to be an especially quake-prone area. Thousands of minor earthquakes are recorded along the fault and in other parts of California every year,

EARTHQUAKE



ABOVE & RIGHT—Devastated sections of downtown Anchorage, and the residential neighborhood of Turnagain Heights after the March, 27, 1964 earthquake.



ABOVE & RIGHT—Damage to the east wing of Olive View County Hospital and to a private home in the San Fernando Valley of southern California caused by an earthquake registering 6.4 on the Richter Scale on Feb. 9, 1971.



but geological evidence indicates that large earthquakes occur along southern sections of the fault about every 150 years. A massive earthquake rocked Southern California in 1857.

The great San Francisco earthquake that struck in 1906 taking about 700 lives and causing millions of dollars in damage was estimated at a magnitude of 8.3 on the Richter Scale (more about earthquake measurements later) and was apparently about the same magnitude as the 1857 quake along the fault's southern portion.

But other, smaller though still strong quakes in California since 1906 have caused many millions of dollars more in damage and killed and injured many people.

The Alaska earthquake of March 27, 1964 was of even greater magnitude than the San Francisco earthquake. The Alaska quake released perhaps twice as much energy and was felt over an area of almost 500,000 square miles. Ground motion near the epicenter was so violent that the tops of some trees were snapped off. One hundred

and fourteen people were killed, some as far away as northern California where a seismic sea wave (tsunami) generated by the Alaskan disturbance struck a small coastal town.

One of the largest earthquakes in the history of eastern North America occurred in Charleston, South Carolina, in 1886 which caused extensive damage and 60 deaths. Other damaging quakes have occurred in areas of the Midwest and eastern U.S.

Additionally, the northeastern U.S. has



Damage was substantial in the California town of Coalinga after an earthquake struck May 2, 1983 with a magnitude of 6.5.

a history of small to moderate earthquakes, some of them damaging, but it could also have major earthquakes in the future, according to a report by the U.S. Geological Survey.

Study—Nuclear reactors, dams, schools, high-rise apartment buildings and housing developments are being planned and built in places where the danger of major earthquakes is ever present. This has created an urgent need for more information on the nature, causes and effects of earthquakes.

Many scientists, including those of the U.S. Geological Survey's National Center for Earthquake Research in Menlo Park, California, are studying earthquakes hoping to find methods of prediction and to develop practices that will reduce their destructive effects.

An earthquake is the wave-like, sometimes violent movement of the earth's surface that follows release of energy in the earth's crust. The energy can be generated by a sudden dislocation of segments of the crust, by a volcanic eruption, or even by man-made explosions. Most destructive quakes, however, are caused by dislocations of the crust.

When subjected to deep-seated forces (whose origins and natures are largely unknown), the crust may first bend, then, when the stress exceeds the strength of the rocks, break and snap to a new position. In the process of breaking, vibrations called "seismic waves" are generated which travel from the source of the earthquake to more distant places along the surface and through the earth at varying speeds, depending on the medium through which they move. Some of the vibrations can actually be heard, as they are of a high enough frequency, while others are of very low, inaudible frequency. The vibrations caused by earthquakes cause the entire planet to quiver or ring like a bell or tuning fork.

A *fault* is a fracture in the earth's crust along which two blocks of the crust have

slipped with respect to each other. Faults are distinguished by the types of movements they make. One crustal block may move horizontally in one direction while the block facing it moves in the opposite direction. Or one block may move up while the opposite block moves downward.

Movement along California's San Andreas Fault is mostly horizontal and the fault is known as a "strike-slip" fault. A fault in which the movement is vertical is called a "dip-slip" fault. Along many faults, movement is both horizontal and vertical.

Earth scientists have discovered that earthquakes tend to recur along faults, which reflect zones of weakness in the earth's crust. When a fault zone experiences an earthquake there are no assurances that enough stress has been relieved to prevent another quake.

The *focus*, or region where an earthquake's energy originates, is usually concentrated in the crust and upper mantle. Since there is a depth of about 4,000 miles to the center of the earth's core, earthquakes can be considered to originate in relatively shallow parts of the earth's interior. The focus of deep earthquakes may reach depths of 700 kilometers (440 miles). Earthquakes along the San Andreas and associated faults have shallow focal depths. Most have a depth of less than 10 miles. In the past 100 years, earth movements have occurred along more than half the entire length of the San Andreas Fault and the rupture itself is visible at the land surface in many places.

It is believed that very shallow earthquakes are probably caused by fracturing of the brittle rock in the crust or by internal stresses that overcome the frictional resistance locking opposite sides of a fault. The immediate cause or causes of intermediate and deep earthquakes is not fully understood.

An earthquake's *epicenter* is the point on the earth's surface directly above the focus. The location of an earthquake is commonly described by the geographic

position of its epicenter and by its focal depth.

Earthquakes beneath the ocean floor sometimes generate immense seismic sea waves or *tsunamis* (Japan's dreaded "huge wave"). These waves travel across the ocean floor at speeds up to 960 kilometers (600 miles) per hour, and may be 15 meters (50 feet) high or higher by the time they reach the shore. During the 1964 Alaska earthquake tsunamis engulfing coastal areas caused most of the destruction at Kodiak, Cordova and Seward and caused severe damage along the west coast of North America, particularly at Crescent City, California. Some waves even raced across the ocean to Japan.

Landslides triggered by earthquakes often cause more destruction than the earthquake shocks themselves. During the Alaskan quake, shock-induced landslides destroyed parts of the Turnagain Heights residential development and downtown areas of Anchorage.

Quake Vibrations—Two general types of vibrations produced by earthquakes are *surface waves* which travel along the earth's surface and *body waves* which travel through the earth. Surface waves usually have the strongest vibrations and probably cause most of the damage done by earthquakes. Body waves are of two types, *compressional* or *primary* (P) waves, and *shear* or *secondary* (S) waves. Both types of body waves pass through the earth's interior from the focus of an earthquake to distant points on the surface, but only P waves travel through the earth's molten core. Because P waves travel at great speeds and ordinarily reach the surface first, they are referred to as primary waves. Since S waves usually reach the surface after the P waves, they are referred to as secondary waves.

The first indication of an earthquake will often be a sharp thud, signaling the arrival of compression waves. This will be followed by the shear waves and then the "ground roll" caused by the surface waves.

The *magnitude* of an earthquake is expressed by the Richter Scale. It is a measure of the amplitude of the seismic waves and is related to the amount of energy released. The *intensity* of a quake is expressed by the Modified Mercalli Scale and is a subjective measure describing how severe a shock was felt at a particular location.

The Richter Scale, named after Dr. Charles F. Richter of the California Institute of Technology, is the best known scale for measuring the magnitude of earthquakes. The scale is logarithmic, so a recording of 6, for example, indicates a disturbance with ground motion 10 times as large as a recording of 5. A quake with a magnitude of 2 is the smallest quake

Continued on page 30

Pocket Tool Kits:

Swiss Army Knives

Having the right tool when you need it can be a life-or-death matter . . .

By Brian Freeman

I WAS STUCK in a snow drift without any provisions and the night was closing in. Had it not been for my . . . Swiss Army knife), with which I sawed off a branch 15mm thick to serve as a lever, my life would have been in jeopardy because of the intensive cold."—Jose' Luis Botti, Buenos Aires.

"I crashed on a flight from Reims, France to Freiburg i. Breisgau . . . I owe my life to a Swiss Army knife . . . With its help, I was able to cut my way out of the burning wreck of the plane."—Eugen Knosp, Freiburg i., Breisgau.

When was the last time you needed a screwdriver and didn't have one? Chances are it was a lot more recent than the last time you needed to skin a rabbit. As the stories above graphically point out, having the right tool when you need it can be a life-or-death matter. There are times when a hunting knife or combat dagger are useful, but unless you live off the land or in a combat zone, it's not very often.

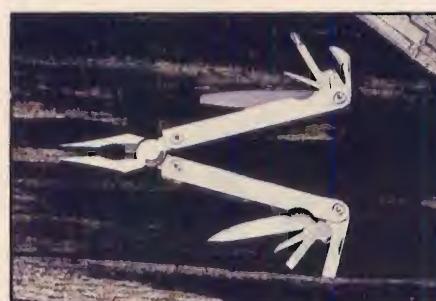
Most of us rely on technology in our everyday lives, and as we all know, technology has a way of breaking down when we need it most. Sometimes we have the luxury of a tool kit, but all too often we only have what's on our person. It's times like these that you need a tool kit in your pocket.

I wasn't a fan of Swiss Army knives from the start. I used to think those silly-looking knives with all the little blades were for gadget freaks. They looked too small to be very strong or practical. Then I got a job where it wasn't appropriate to carry a folding hunter. I felt naked with no blade at all, so I decided to get a slender, sensible pocket knife with a few useful accessories. I like to fix things, so it was only natural that I'd end up buying a Swiss Army knife called the Tinker. Since then, I've become the owner of four more Swiss Army knives, (not including the one I loaned to my wife and never got back).

Many owners of single blade knives say "Yeah, all those little tools are nice, but in a real emergency my knife can do anything they can do." Well . . . yes and no. You can open a can with your hunting knife, but you'll spend an hour resharpening your blade. With a lot of effort, you can hack through branches for an emergency



Pocket tool kits, from upper left clockwise, are: Wenger Pointer; a version of the knife issued to the Swiss Army; Wenger Scout; Victorinox Champion; Victorinox Safari; Leatherman Tool; and the Wenger Official Boy Scout knife.



ABOVE LEFT—The minimum. The Scout has only one cutting blade. Note the Phillips screwdriver is mounted on the back in a "T" form.

ABOVE—The maximum. The Pointer is the largest pocket knife made. It has every accessory available. The lock release is located to the left of the main blade.

LEFT—The Leatherman Tool's pliers provide a distinct advantage over Swiss Army knives in many circumstances.

shelter, but the saw-blade on a Swiss Army knife can cut through one faster and with much less effort. Cutting a butterfly bandage from adhesive tape is a major chore with a blade, but easy with small scissors.

And there are some things a utility knife can do that are completely out of a hunting

knife's class. Like removing Phillips head screws and filing down fouled ignition parts in the middle of the desert. But convenience is the main thing a utility knife can provide that a single blade can't, and it converts to a lot of savings in time and energy.



Bulk is a major consideration when choosing a pocket tool kit. The thin profile of the Scout, left, will fit comfortably in your pocket. The Champion, right, should be carried in a belt pouch.



Wenger's Universal Wrench isn't nearly as effective as the Leatherman Tool but works well on small bolts.

Classics—The Swiss are known for being meticulous and precise. They know quality and efficiency when they see it. In 1891, the Swiss Army began purchasing the Swiss Army Officer's knife from Karl Elsener, founder of the company that would later be called Victorinox. (From Victoria, the name of Karl's mother and INOX, the designation for stainless steel.)

In 1908, the Swiss adopted the officer's knife as standard issue for all troops, and contracted with two companies to produce them: Victorinox and Wenger. Both companies are still manufacturing knives for the Swiss Army, which at times causes confusion because both companies can claim they produce the "original" and "genuine" Swiss Army knife. Both manufacturers have their share of fame outside the Swiss Army as well. Wenger makes the Official Boy Scout knife and the Victorinox Craftsman rides as standard equipment on the Space Shuttle.

From the basic 4-blade military model, accessories started sprouting like weeds, eventually evolving into the 20+ accessories on today's monsters. The combinations of these accessories are as diverse as the accessories themselves—both Victorinox and Wenger carry more than 50 different models in the U.S.

Construction—Of course, the most important survival considerations are reliability and durability. In this area, both brands get high marks.

Wenger uses surgical stainless steel (No. 4034 chrome steel containing 14 percent chrome and between .5 and .55 percent carbon) and makes blades by a laminating process rather than forging. It tests out to a Rockwell hardness of 54-56C. Victorinox blades test out at 58C, but they keep the grade of steel they use a secret. They still use drop forging to make their blades.

The handles from both manufacturers are made of a variety of tough materials. Wenger uses red or black Tenite Butyrate on most models. This material is bonded to

the handle under 2,000 pounds of pressure to make an unbreakable, rivetless exterior. The handles on the military model are aluminum, and the Dynasty series has elegantly engraved black anodized aluminum handles. Victorinox uses a wider variety of materials, including aluminum, stainless steel and cellulose (the familiar tough, red or black plastic). Victorinox also has some models in olive drab.

The frames of both knives are made of aluminum with brass hinge pins, making them both corrosion-resistant and lightweight.

Victorinox takes a small edge in quality and a large edge in availability, but Wenger's "We Try Harder" attitude has given them the lead in innovation. Victorinox has been conservative in design, sticking with the tried and tested conventional accessories. Wenger, on the other hand, has made a number of improvements, the most significant being a locking main blade and locking screwdriver.

Both knives are warranted against defects in materials and workmanship for the life of the original owner. Keep in mind that they're designed for light to medium duty jobs. Like all folding knives, the weakest point is the hinge, so prying with any of the blades is the most damaging thing you can do. Don't worry about using the screwdrivers, though. The frame may twist a little with stubborn screws, but the hinges are strong enough to handle the torque without problems.

There are a number of cheap imitations of Swiss Army knives on the market. To be sure what you're getting, look on the shank of the large blade. If it doesn't say Victorinox or Wenger, stay away from it. Victorinox reports getting many imitations mistakenly returned to them with complaints about quality.

Leatherman Tools—Tim Leatherman was making a "budget" trip through Europe when he discovered his pocket knife just wasn't enough to handle repairs

on his "budget" car. What he needed was a pair of pocket pliers. He put his engineering degree to work and seven years later, the Leatherman Tool was born.

While the Leatherman tool doesn't really qualify as a knife, it certainly qualifies as a unique pocket tool kit: it provides a compact collection of tools capable of repairing a variety of equipment.

Unlike Swiss Army knives, the Leatherman Tool only comes in one configuration. The frame of the tool unfolds like a Japanese fan to expose the major tool: a combination needle nose pliers and wire cutter. This accessory can't be matched by anything on a Swiss Army knife, so if you frequently require pliers, this tool has an undisputed advantage. Each handle encloses a variety of tools, which include three standard screwdrivers (from large to eyeglass size), Phillips screwdriver, file/metal saw, can opener and 2 1/4-inch blade. Eight inches of ruler are inscribed on the outside of the handles. The blades can be safely locked in place by closing the handles with the blade extended.

The unit is made completely of high quality stainless steel that meets or exceeds military requirements for hardness and durability. It's warranted against defects in materials and workmanship for 25 years. While the tool isn't standard issue in the armed forces, their customers include the Coast Guard, the Marines, the FBI and several police departments.

Weighing in at 5 ounces, the Leatherman Tool is too heavy and bulky to carry in a pocket, but comes equipped with a belt pouch. The fan-like arrangement makes getting to the accessories a little more clumsy than a pocket knife, but this minor inconvenience goes away with familiarity.

Making A Choice—There are several considerations when choosing a pocket tool kit. The main two are size and use.

First decide which accessories would be useful to you. A list of all available gadgets

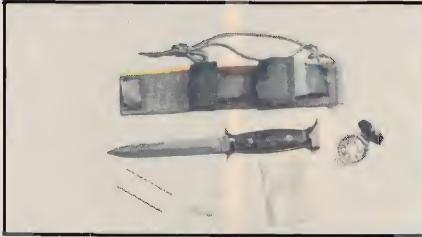
Continued on page 72

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Features:

11 1/4" overall length, Anti-Reflective sandblasted, phosphate coated 6 1/4" carbon steel blade. Full length cutting edge one side, 2 1/2" serrated tip and 4" safety saw opposite. Machine tooled guard with flat head screwdriver one end, phillips head opposite end. Two piece heat resistant, checkered non-slip safety grip handle secured with double machine screws. Solid butt piece claw for nail pulling and chiseling, flat side also functions as hammer. Nylon triple pocket sheath in camo color, molded liner with steel retainer springs, mounted on olive drab webbing with velcro closures and leg strap. Sheath pockets with survival gear include; sinkers, hooks and fishing line., Magnesium fire starter. Matches: Needles: Compass: Flint pad; Ring saw: 5 year warranty. Made by Imperial Knife, Division of Imperial Schrade Corp.



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ASGI	

EARTHQUAKE

Continued from page 27

normally felt by humans. Earthquakes with a Richter value of 6 or more are commonly considered major in magnitude. Great earthquakes such as the 1906 San Francisco and 1964 Alaskan quakes have magnitudes of 8.0 or higher. One such great earthquake occurs somewhere in the world every year, on the average. The Richer Scale has no upper limit, but the largest known shocks have had magnitudes of 8.8 to 8.9.

The Modified Mercalli Scale expresses the intensity of an earthquake's effects in a given location in values ranging from I to XII. The most commonly used adaptation covers the range of intensity from the condition of I—not felt except by a very few under especially favorable conditions, to XII—Damage total; lines of sight and level distorted; objects thrown upward in the air.

The Modified Mercalli intensity value assigned to an earthquake site is a more meaningful measure of severity to the layman because intensity refers to the effects actually experienced. Evaluation of earthquake intensity can be made only after eyewitness reports and results of field investigations are studied and interpreted. The maximum intensity experienced in the Alaska quake of 1964 was X. The San Francisco earthquake of 1906 reached a maximum intensity of XI.

Earthquakes of large magnitude do not necessarily cause the most intense surface effects. The effect is a given region depends on local surface and subsurface conditions. An area underlain by unstable ground (sand, clay, silt), for example, is likely to experience much more noticeable effects than an area equally distant from an earthquake's epicenter but underlain by firm ground such as granite.

An earthquake's destructiveness depends on many factors. Besides magnitude, these include the focal depth, distance from epicenter, local geologic conditions, and the design of buildings and other human construction in the area shaken by the quake.

Much of our present understanding of earthquakes is related to the field of plate tectonics. According to what is known about plate tectonics, the earth's crust is broken into enormous slow-moving plates. There are seven very large plates, each consisting of both oceanic and continental portions, and a dozen or more small plates. Each plate is about 80 kilometers (50 miles) thick and can be pictured as having a shallow part that deforms by elastic bending or by brittle breaking, and a deeper part that yields plastically, beneath which is a viscous layer on which

Continued on page 69

ARMY - NAVY SURPLUS

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ABANDON HOPE WORTH YOUR LIFE

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CRIMINALS BEWARE ROB SOMEONE ELSE

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CRIMINALS BEWARE WE SHOOT BALES

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WARNING!!! NO DAYTIME ASSAULT NO EXPLOSIONS ACCEPTED NO ONE LEFT ALIVE

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DEATH FROM ABOVE

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DON'T MESS WITH FATE

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WE KILL ALL WE GOD SENDS GIVE THEM HELL

09-344

WE ARE AIRBORNE WE KILL FOR PEACE

09-345

WARNING BITES ARE WORSE THAN THEIR BARK

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DON'T OPEN THIS GATE

09-347

WE KILL FOR PEACE

09-348

WE ARE AIRBORNE WE KILL FOR PEACE

09-349

TRESPASSERS WILL BE SHOT

09-350

EXPECT NO MERCY

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HAVE GUN WILL SHOOT

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DEM:

Emergency Medical Kits

A disaster situation creates a loss of access to medical facilities and care . . .

By Michael Cammisa

THE LOSS OF organized medical care ranks as the most significant detrimental effect of a disaster. A disaster situation creates a loss of access to medical facilities and care, and simultaneously generates a dramatically increased need for such services. The result of such a situation has two historical precedents. The victims of the Hiroshima and Nagasaki nuclear attacks went without medical care because of the destruction of medical facilities and the enormous numbers of casualties generated in so short a period of time. Later studies clearly showed that many more might have lived and many others might have escaped permanent disability had simple first aid been applied shortly after wounding.

DEM—The purpose of disaster emergency medicine (DEM) is to provide alternative means of medical care in times of serious disruption of normal life. Because of the centralized nature of modern medicine in large urban cultures, the population needs are met by a relatively few facilities of large size. Urban culture relies on uninterrupted access to these facilities in the event of serious injury or illness. We are accustomed to modern up-to-date equipment and knowledge when it comes to our health needs. Sudden loss of access to modern medical care when it is needed most is not generally anticipated by the majority of the population of our country. This situation places our urban culture in extreme jeopardy should the unanticipated ever occur.

On another level, however, we are accustomed to providing limited medical care for ourselves. Americans use enormous amounts of over-the-counter (OTC) medications to treat a variety of mild ailments ranging from the flu to acne. Many people have at least a rudimentary first aid kit in their home or car. Minor injury is so common that it would be impractical to see a doctor for every cut and abrasion. Medical preparedness measures are quite familiar to just about every person.

It is a short step toward the realization that DEM is a home medicine chest and first aid kit on a professional care scale. But it should not be misconstrued that merely possessing the proper equipment qualifies one to perform definitive medical intervention of illness and injury. Medical



These are some of the items which might be found in a field first aid kit.

intervention can be divided into two main levels of action. The first level is first aid, which means precisely what it says. The second is definitive care which is directed toward complete management of the condition. The purpose of the first is to alleviate the ongoing detrimental effects of the medical problem and to buy time to obtain definitive treatment. The procedures of first aid are not complicated and often delete the administration of medication. The concept is to do as much good as possible while limiting the amount of harm that may be done by a medically nonqualified person. This idea is extended by what is known as advanced first aid. This is first aid calculated for the treatment of more serious illness or injury. With advanced first aid procedures we may see the administration of OTC medications, definitive resuscitation methods, and the recognition training for complex medical emergencies.

Definitive therapy for serious illness and injuries must be present in a situation where access to normal facilities is impossible. Lack of such capability inevitably consigns the victim to fate by placing him outside the range of human intervention. The problem of preparing for definitive

medical care in a disaster situation is very complex. The major factor which will determine the capability to administer definitive care is the level of medical training possessed by the person responsible for the survival group's medical care. If a group is fortunate enough to have a medically trained person affiliated with the team then the problem focuses on that person training thoroughly in DEM.

Regardless of the survival group's medical personnel assets, everyone should and *must* be trained in first aid procedures. If there is a group medical professional, it is his responsibility to see that all members refresh their training at regular intervals. A group without medical capability should make every effort to attain the services of a medical professional that will provide coverage for the group should an emergency occur. During training for survival it is prudent to have a medical person providing medical coverage should illness or injury occur.

Acquisition, Stockpiling—Assuming a trained medical professional is available to provide care, the next major consideration is the acquisition and stockpiling of the necessary equipment and supplies. This is

one area where expense is a factor and where few compromises can be allowed. Lack of proper materiel ties the hands of the most qualified medical person. Unfortunately, it has been my observation that expense and difficulties in acquisition deter even the most dedicated survival group from properly outfitting themselves for DEM. Another problem is the retention of expired medications and unsterile equipment and supplies. The best medical outfit requires diligent maintenance in order to be effective in its mission. Lack of proper medical tools and the use of non-functional equipment and supplies are the basis of much criticism against public medical preparedness.

The problem of acquiring adequate amounts of the necessary medical equipment and supplies can be solved by several different methods. A medical professional that is part of a survival team is a good source of essential materiel. Surgical supply stores often will sell advanced equipment if a reasonable explanation is given for the purchase. A sympathetic physician may provide help. The best way to begin stockpiling equipment and supplies is to purchase every easily obtainable and useful item available in drug stores and the like. Concentrated efforts can then be made to acquire the more difficult items through whatever method holds the greatest prospect of success.

DEM EQUIPMENT AND SUPPLIES

I. First Aid Requirements:

A. Every member of the survival team must possess an individual field first aid kit. This is needed for immediate treatment in the event of a field emergency.

Contents—

Container 1, belt type
Minor sterile dressings 10, assorted sizes
2"x2" sterile gauze 5, individual pkgs.
4"x4" sterile gauze 2, individual pkgs.
Butterfly sutures 10, indiv. sterile pkgs.
Skin tape, cloth 1, roll
Povidone iodine ointment 1, tube
Hydrocortisone ointment 1, tube 1% con.
Splinter forceps 1, nonsterile

The above minor trauma set is designed to cope with minor soft tissue injury, foreign bodies of a minor type, and skin dermatoses due to contact with poison ivy, oak and sumac. These conditions are the most common types encountered in a wilderness setting. Though not contained within the kit because of space limitations, an accessory medication pack should be carried in the pocket. The contents of medication kit includes:

1. Aspirin, tylenol or Ibuprofen
2. Antihistamine
3. Antacid
4. Throat lozenges

B. The collective first aid kit contains a larger amount of supplies covering a broader range of medical intervention.

Contents—

Container 1, rigid container, portable



ABOVE LEFT—Silver Sulfadiazine cream is an antibacterial agent for treatment of burns.

ABOVE—A portable blood pressure instrument can be useful in field medical treatment.

LEFT—Antibacterial ointment is used here to treat a minor laceration.

Dressing Section

Minor sterile
dressings 2 boxes, assorted sizes
2"x2" sterile
gauze 2 boxes, individual pkgs.
4"x4" sterile
gauze 2 boxes, individual pkgs.
4"x6" petroleum
gauze 1 box, individual pkgs., sterile
6"x8" Surgipad
dresings 1 box, individual pkgs., sterile
4"x4" Telfa
gauze 1 box, individual pkgs., sterile
Expandable sterile
gauze bandage 10, individual pkgs.
Triangular bandage,
nonsterile 5, individual pkgs.
Eyepads, sterile
gauze 1 box, individual pkgs.
Skin tape, cloth
type 10, rolls, wide width
Plaster cast
dressing 1 box, individual rolls
Air splits, vinyl 10, assorted sizes

Trauma Instrument Section

Scalpel handle, #3 1, nonsterile
Scalpel blades, #10-#15 5 each, sterile
individual pkgs.
Needle holder 1, large
Hemostats, straight & curved 5 each,
Kelly Murphy type
Hemostats, straight & curved 5 each,
Mosquito type
Dissecting scissor, straight 1
Splinter forceps 2, large & small
Sutures, 30 Ethicon silk 1 box of 15
individual sterile pkgs.

Diagnostic Section

Thermometers, oral and rectal 2 each
with disposable covers

Otoscope/throat illuminator 1 with
spare batteries

Sthethoscope 1, diaphragm type

Blood pressure unit 1, ameroind type

Percussion hammer 1

Throat sticks 1 box

Examination gloves 1 box

Resuscitation Section

Airways, nasal and oral 10 each,
assorted sizes

Esophageal Obturator Airway 1

AMBU BAG 1, with assorted masks

Oxygen, portable cylinder 1, with air
lines and adaptors

Medication Section

Lidocaine, 1% 1, 50 ml multidose vial
Aspirin, acetominophen, ibuprofen 100
of each

Benadryl capsules 50, 25 mg dose

Robitussin 5 bottles, 8 fl oz

Compazine pills 100, 10 mg dose

Tigan suppositories 100, 200 mg dose

Actified pills 100, 2.5 mg dose

Glycerin suppositories 1 jar

Pepto Bismol 10 bottles

Hydrocortisone ointment or cream 10
tubes, .5% or 1%

Chloraseptic throat spray 10 bottles

Zephiran Chloride spray 10 bottles

1:750 17 grams

Povidone iodine ointment 50 tubes

Sterile saline for irrigation 10, 1000 ml
bottle

Syringes, 1 cc and 5 cc 10 each

MEDICAL KITS

RIGHT—Though they may seem insignificant until needed, tweezers make the difference between relief and constant pain from slivers, a common problem in the field.



LEFT—Stretchable gauze in a first aid kit has many applications.

Definitive Treatment—Medical requirements beyond the advanced first aid level pose a difficult stockpiling problem for survival groups interested in complete independent medical ability. Many of the definitive treatment drugs and equipment are legally restricted or too expensive for purchase. To this is added the problem that such drugs and equipment are virtually useless and potentially very dangerous unless a qualified physician or surgeon is present to use them. A decision as to the medical capability level of stockpiling efforts should be based upon the likelihood of obtaining qualified medical professionals to care for the survival group's needs in the event of an emergency.

Advanced first aid capability requires the services of a trained paramedic to render care. The drugs and equipment in the advanced first aid kit are capable of serious harm if used by unqualified persons. Competent first aid training for all group members will help to reduce the incidence of unqualified heroic attempts to treat serious injury and illness. Such training will also relieve the group paramedic of the burden of caring for minor injuries and illness and leave him free to give intensive care to more serious casualties.

DEM Goals—The major goals of preparedness for DEM include:

1. Trauma management of the increased frequency of soft tissue wounds, fractures, burns, shock, etc., as a consequence of disaster is well recognized as the primary preparedness goal of DEM. This is the result of wounding capacity of the agent of disaster and from the panic and confusion which is generated. Violence, entrapping

ments, accidents caused by haste and so forth are certainly going to be present during a disaster.

2. The capability to treat minor illness is a major area of preparedness because of the serious consequences that may result from incapacitation caused by illness in a disaster situation. Any illness which decreases performance and limits purposeful activity will create a serious impediment to constructive survival efforts when they are most needed.

3. Sanitation and Hygiene preparedness may be best termed preventive medicine. Under disaster conditions the knowledge and ability to limit the occurrence of contagious diseases is crucial to long-term survival. Disruption of the normal workings of civilization results in a loss of the normal means of human and non-human waste disposal, protection from insect and animal hazards, preservation of food and prevention of food-borne diseases. Loss of these services combined with overcrowding is conducive to the development of serious outbreaks of diseases. A major preparedness measure is to ensure full-scale immunizations of all survival group members.

Preparedness for trauma management in a disaster includes the following areas:

1. Cuts, lacerations, abrasions, etc., of a nature to require definitive treatments for recovery are likely to be common-place during a disaster. Treatment of soft tissue injuries can be attempted under circumstances where medical facilities are no longer available and the lack of treatment will result in crippling deformity or death. Comprehensive training in the methods and procedures of soft tissue trauma man-

agement is necessary to securing a successful result. Equipment required for this work is included in the advanced kit.

2. **Serious burns under disaster** conditions may occur because of the increased dependence on the use of open fires, propane and gasoline lanterns, heaters, etc. For the management of minor burns, the contents of the advanced first aid kit are adequate. The definitive management of serious burn injuries requires the stockpiling of restricted equipment and drugs. If a survival group has the services of a qualified medical professional, it is prudent to assemble both a shock treatment set and surface burn treatment set to manage serious burn injuries.

The equipment and medications listed below are controlled by federal regulations and are not obtainable by lay persons.

Intravenous solutions in 1000-cc, 500-cc, and 50-cc plastic bags. Solutions include 0.9 percent Normal Saline, Lactated Ringer's solution, 5 percent Dextrose in water, Human serum albumin, Plasma, Plasma Protein Fraction, Dextran. Intravenous administration sets consist of the drip chamber and plastic line that attaches the solution to the patient. Various types of infusion sets are commercially available.

Infusion needle and cannulas with various gauges and style of infusion needles and plastic cannulas are available to deliver the fluid directly into the blood stream for a prolonged period of time.

Burn Treatment Set:

First Aid Section:

Sterile sheets prepackaged with resterilization schedule

0.9% Normal Saline irrigating solution—
1000-cc bottles

Aluminum space blanket—5

Electrolyte supplement solution (ERG)—
1000-cc bottles

Valium—5 mg. tablets for severe anxiety
and pain

Definitive Treatment Section:

Antibiotic Surface treatment—Sulfamylon cream, Silvadene cream, Silver nitrate .5% with .5% acetic acid, or povidone iodine ointment

Intravenous starter set—Dextran, 500 ml, Dextrose, 5% in water 500 ml, Ringer's lactate, 500 ml, needles, short bevel, 20 gauge, 2" long, disposable infusion sets.

Resuscitation set

3. Broken bones are one of the more common reasons people seek medical care. Proper preparedness measures include the stockpiling of splints, casting material and traction apparatus.

4. Though gunshot wounds are a specific type of wound, this area of preparedness requires special consideration as to the limit of stockpiling efforts. As a gunshot wound is capable of causing injury requiring definitive surgery only possible in well equipped medical facilities, the acquisition of advanced surgical materiel may not be possible or prudent. This situa-

Continued on page 73

After The Catastrophe:

State of Emergency

What powers are available to the various levels of government in emergency situations? . . .

By Michael Pietrantoni

THE 60 LARGEST cities in the United States lay smoldering under a blanket of slowly drifting fallout. From a secret command post well away from what had been the nation's capital, the President issued orders to his military and civil defense chiefs to begin the process of rescue and recovery. Among the very first orders of the President was a declaration of martial law. This declaration in effect suspended the rights and constitutional guarantees of the remaining citizens of the U.S.

The year was 1955, and in the above paragraph only the first sentence is fiction. In 1955, as part of the largest U.S. civil defense exercise ever held, the U.S. was indeed placed in a state of martial law by an emergency order signed by President Eisenhower. Operation Alert as the exercise was known, saw the streets of most major cities cleared by police and civil defense wardens, and the evacuation of the President, his advisors, and more than 15,000 government employees from Washington, D.C. In a move which surprised even the planners of the exercise, President Eisenhower issued a legal executive order instituting martial law throughout the country. The order was *real*, and for the duration of the exercise anyone arrested for a federal offense could legally be denied basic rights and protections.

Exactly what powers are available to the various levels of government in an emergency situation? For those who consider themselves survivalists, those who have taken the time and spent the money to prepare for an emergency, the answers to this question are of vital importance. It becomes clear just how important the laws governing emergency powers are once the survivalist realizes that many of his carefully made preparations for survival may very well become the basis for his internment or worse, by authorities acting under the powers granted them through emergency power legislation. The survivalist may see himself as making prudent preparations for the survival of himself and his family by, for example, storing food in his retreat or shelter. However, consider those preparations from the point of view of those in power in a post-catastrophe U.S. The survivalist's preparedness could be seen as hoarding of vital resources needed by the state for recovery. Should the survivalist refuse to turn over his food supplies to governing authorities, (who might have



An internment camp for Japanese Americans during World War 2. Until 1971 the U.S. maintained six such camps to be used in a national emergency (National Archives).

requisitioned all remaining food stocks), he will most certainly be judged a criminal, and in addition to having his supplies confiscated will no doubt face whatever sanctions are applicable under emergency power legislation.

Should you have any doubts about the state's power to requisition vital supplies during an emergency, consider the following. A manual published in 1973 by the Defense Civil Preparedness Agency (DCPA), designed for use by local civil defense planners includes a chapter entitled "Motivating The Survivors." Part of that chapter reads as follows, survivors would be apt to "focus on the problem of supplying the basic needs of food, water, and shelter for the family. Individual and small group foraging and hoarding of . . . supplies consume available resources and do nothing to bring about re-supply." To prevent this, the manual goes on to advise, "local authorities should take charge of critical supplies" and should use them, "to provide meaningful rewards for productive work."

History—Emergency powers have been invoked by both state and federal governments often throughout the history of the U.S. Far from being limited to wartime use only, emergency powers have been invoked during labor disputes, racial unrest, fiscal crises, the energy and oil shortages in the 1970s, and even during the Iranian hostage crisis of 1979-1980.

During the Civil War the Bill Of Rights was virtually suspended by President Lincoln. Arrests were made, generally in the middle of the night, for a wide range of offenses. Simple public expression of sympathy for the South, or a political attack on the Lincoln administration were grounds enough for arrest. Military officers could and did order arrests of civilians and their incarceration in military prisons. The writ of habeas corpus (the right of a defendant to appear before a judge to assess the validity of an arrest) was suspended. Military tribunals tried, sentenced, and incarcerated civilians.

At the beginning of World War 2, in fact just hours after the attack on Pearl Harbor, the governor of Hawaii, acting at the insistence of the military, declared martial law. The commanding general immediately closed the civil courts in Hawaii and established military tribunals in their place. When martial law was initially declared by the governor of Hawaii it was with the expectation that it would remain in effect only until the threat of invasion was over, a few weeks at most. The military commanders subsequently refused, even under judicial orders, to reopen the courts and return governing powers to the proper civilian and judicial authorities. In one instance the commanding general threatened to court-martial a civilian judge who was issuing writs of habeas corpus. It was a year and a half before the civil courts were re-opened.

STATE OF EMERGENCY



Martial law, imposed in Hawaii after the Japanese attack on Pearl Harbor, saw civilians tried by military courts—even for minor traffic offenses. Current emergency planning calls for imposition of martial law in the post-attack U.S. (Time-Life Books).

World War 2 also saw the detention of more than 100,000 Americans of Japanese ancestry in detention camps. No charges were brought, no trials held. Americans were rounded up and detained for years on the basis of race alone. American law functions on precedent, and no matter the rhetoric one hears today concerning the injustice of what happened, the precedent has been set.

The Iranian hostage crises prompted President Carter to freeze Iranian financial assets in the U.S. To accomplish this President Carter invoked executive order 11490 (issued initially by President Nixon), in conjunction with the invoking of the International Emergency Powers Act of 1977. According to the late Mei Tappan, in his book *Tappan On Survival*, the combination of EO 11490 and the 1977 Emergency Powers Act grant the President "sweeping dictatorial powers which virtually suspend all constitutional safeguards, allow the disbanding of Congress, the freezing of all bank accounts and personal assets, the collection and rationing of all vital commodities, including food, the suspension of passports, full control of the media and private means of communication, including Amateur and CB radios, the banning of all travel, public assembly or protest."

State governments have also often in-

voked emergency powers. Martial law and limited "states of emergency" were often used during strikes and other labor unrest. Governors invoking emergency powers generally do so under their mandate to maintain the public safety and order. Of particular interest to those concerned with life in a post-catastrophe U.S. are the provisions in most state constitutions authorizing state militias. It is generally held that *all able bodied men* are considered to be members of the state militia and are subject to call-up in times of emergency. Their consent is not necessary and they may be impressed into service. The implication for the "legal" forced labor of survivors of a catastrophe is obvious. These statutes have been used in the past during labor disputes. In 1946 the governor of Virginia ordered Electric and Power Company employees about to strike embodied into an emergency unit of the state militia. The order stated that should a strike occur, the state would take possession of the utility and transfer the employees to active military service. Once such an order was issued the workers would be compelled to remain at work under the threat of military punishment.

Current Status—In a paper prepared for the Senate Special Committee on National

Emergencies and Delegated Emergency Powers, Dr Harold Relya of the Library Of Congress, noted that, "the U.S. has on books at least 470 emergency power statutes" which may be implemented and enforced "without time limitations" as to their durations.

Emergency powers include executive orders, (classified and unclassified) issued by the President. According to the Relya report, "this vast range of powers, taken together, confer enough authority to rule this country without reference to normal constitutional processes."

From 1950 until its repeal in 1971, the U.S. had in place a law, the Emergency Detention Act, part of the Internal Security Act of 1950, which established six secretly located detention centers to be used for confinement of persons arrested under the provisions of the act. These camps were located across the country in the states of Arizona, Oklahoma, Florida, California, and Pennsylvania. Upon a presidential declaration of an "internal security emergency," the federal government would be granted the power to arrest and detain anyone who it was felt might conspire or engage in "subversive" acts. The law allowed for infinite detention of such persons, denial of a jury trial and bail, and even the right to confront an



Despite protests of the owner, military police insure he does not interfere with the requisition of scrap metal needed by the government during World War 2. Emergency laws, then and now, allow government to seize vital supplies (Time-Life Books).

accuser. In 1971 the Emergency Detention Act was repealed by Congress and four of the six detention camps were shut down or destroyed.

The range of emergency powers which are available to the government in times of crises is staggering. Food rationing, martial law, seizure of private property—ranging from homes to CB radios and computers, to forced involuntary service in work crews, and on and on. Let us examine some of the specific emergency power authorizations and their impact upon those who, by either careful preparation or simple luck, survive World War 3.

Property, Seizure, Rationing—The 1973 DCPA manual referred to earlier in this article includes a chapter entitled "Establishing The Food Supply." This chapter assigns responsibility for "primary" food resources (unprocessed grain, government stored surplus, etc.) to the U.S. Department of Agriculture. The responsibility includes the processing, management, and distribution of these supplies. Such distribution as is likely to occur, given transport, fuel, road blockages, and other problems, will be made to central staging areas and control points. Such centralized distribution will allow state and local authorities to effectively institute a food rationing

system.

Secondary food resources (those within the immediate control of state and local authorities) will be under local governmental control. The DCPA manual addressing this point states, "State and local governments must control the use of 'secondary resources' of food in the hands of local wholesalers, retailers, and in households . . . current plans involve consumer rationing of essential items, including food, even in undamaged localities where supplies would appear to be ample."

Foodstocks are considered so important to post attack recovery that the Emergency Preparedness Project of the National Governors Association has issued a set of emergency guidelines which indicate the government's willingness to use food and its distribution to maintain its own viability. From those guidelines, "The regional and national stockpiles . . . have great potential for the government as a backing for its post attack authority." The seizure of foodstocks by authorities would be most effective if done before the actual attack. "One way for the federal government to maintain confidence . . . would be to requisition . . . stocks of food, fuels, and other assets during the pre-attack crises."

Continued on page 38

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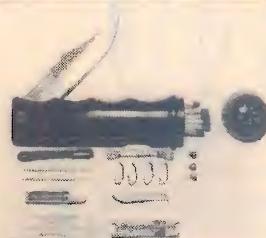
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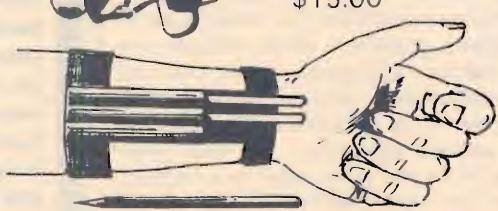
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STATE OF EMERGENCY

Continued from page 37

Along with the confiscation and control of foodstocks it should be noted that in all government manuals concerning shelter management, persons entering shelters are to do so without weapons, logical in the circumstances, but in effect compelling a survivor to trade his weapon for food. There is little reason to believe that along with food, fuel, vehicles, CB radios, etc., that weapons and ammunition will not fall not the "confiscated or seized" category of the other "vital" necessities.

Billiting Of Refugees—Much attention has been paid by the government to another critical post-attack problem, that of housing for survivors and refugees. The Department Of Housing and Urban Development has already worked out the procedures required to requisition the homes of "owners who have disappeared," to help in housing survivors. Little reason can be found to disagree with this policy concerning "ownerless" dwellings. But what of homes and property of owners who reside within? Will an owner have the right to reject or evict an evacuee? Obviously not. The DCPA manual states, "the rights of property owners might need to be suspended so that a crisis relocation might not be delayed or jeopardized by their resistance in accommodating evacuees." And from a report entitled "The Effects Of Nuclear War" published by the Congressional Office of Technology Assessment, "the government might find it necessary to force persons having homes to house families who had lost their homes." In the same report is a fictional account of one town's attempts to cope with the aftermath of a nuclear war. "The city manager and the emergency government attempted to solve the refugee housing problem by billiting refugees in private homes. At first they asked for volunteers, but got few. The authorities then announced that any house with fewer than 2 people per room would be assigned a refugee family. Resistance to this order was strong, and, particularly in the outlying areas where it was hard to check, outright defiance was common. Families would pretend to comply and then simply force the refugees out as soon as the authorities had left. The refugees would struggle back to town, or take up residence in barns or garages."

Conscription For Labor—Those people who had taken refuge in public shelters, along with those who later converge upon food distribution sites will form a convenient labor pool upon which to draw. In the post-attack environment, authorities will, as we have seen, use foodstocks as

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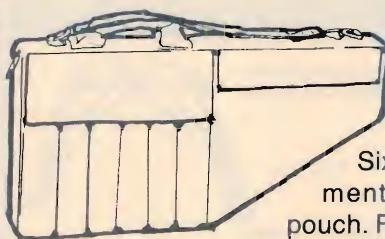
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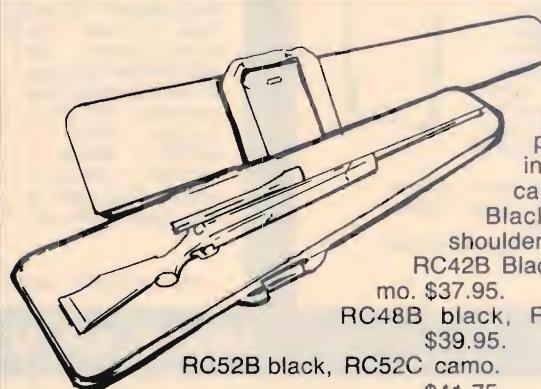
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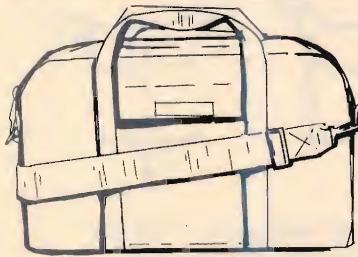
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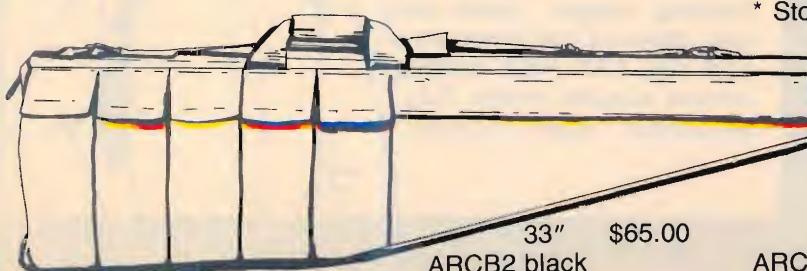
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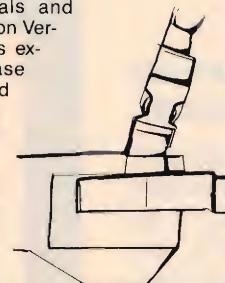


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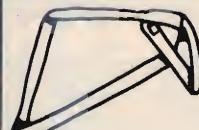
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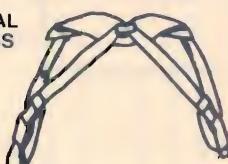
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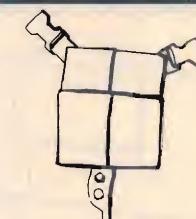
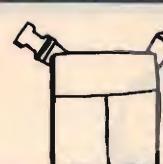
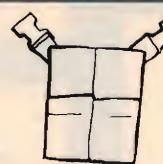
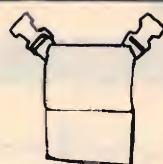
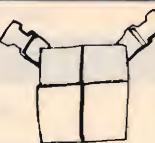
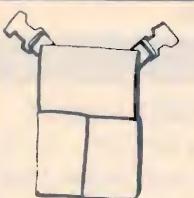
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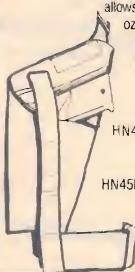
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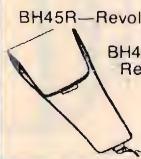
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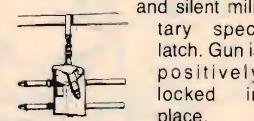
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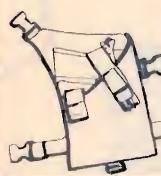


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BELT CLIP HOLSTER

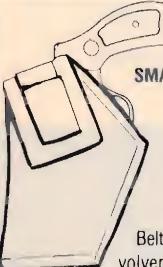
Metal belt clip on back of holster. Sewn in sight track. Made to be worn inside the waistband. 5-layer ballistic nylon. Excellent concealment holster.

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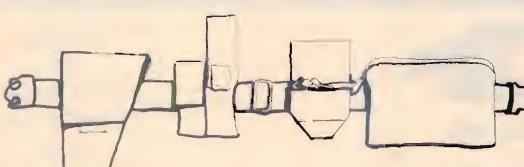
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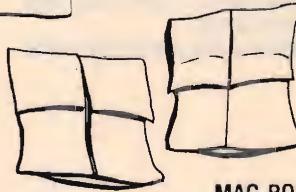


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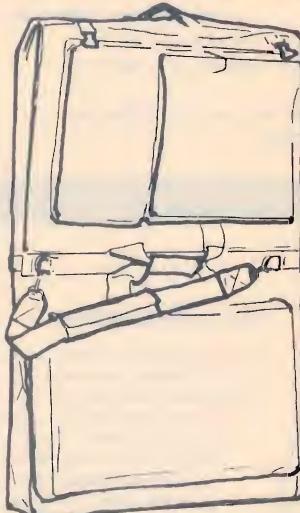
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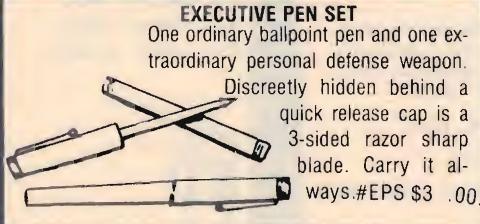
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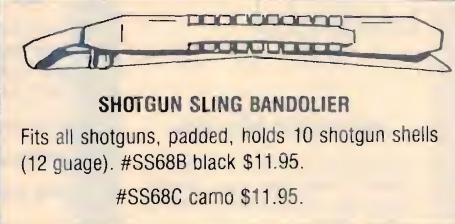
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STATE OF EMERGENCY

Continued from page 38

"currency" for labor. There will be heavy demand for laborers to clear roads and buildings of debris, to salvage useful items buried in the rubble, and of course to bury the dead. Initially, governing authorities might try to rely on volunteers for this work, however, the authority for involuntary conscription does exist and there is little doubt that eventually it will be used.

In a study prepared for Congress entitled "Economic and Social Consequences of Nuclear Attacks On The United States," we find the following, "it may become necessary for the government . . . to conscript human resources for . . . relief efforts. Whether the population . . . will readily acquiesce in such measures remains to be seen. The experience of other countries in analogous circumstances . . . indicates that this will pose a significant problem for authorities." Later in the same report, "In many cases, families will be broken up by death, injury, disease, evacuation, or by military or labor force conscription."

Involuntary labor may well continue past the "clean-up" stage of recovery. The Defense Resources Act gives the government the power to requisition surviving production facilities of every type. In an article in *Datamation* magazine referring to the electronics and telecommunications industry, author Charles Howe notes that authorities can, "require for government service critically needed workers, including everyone from data processing managers to programmers to circuit board assemblers."

Administration Of Justice—When seizure, requisition, conscription, etc. are contemplated as real possibilities, the prudent individual must understand that those policies will be enforced by military or paramilitary personnel, and with little regard for the individual's conception of his "rights." Legal "street justice" may be more a norm than an aberration. Government acknowledges this, as in the following. (taken from the National Governors Assoc. Emergency Preparedness Project). "As the crisis levels become more intense, adjudication of disputes related to the acquisition of survival supplies, individual and property rights, contracts, compensation, and law and order will have to be made extremely rapidly, perhaps on the spot. The urgency would tend to make such decisions relatively authoritarian and arbitrary."

In the early 1960s, during one of the periodic reorganizations of U.S. civil defense efforts, Congressman Chet Hollifield in a speech before the House Of Representatives said, ". . . we can be cer-



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Continued on page 59

Thirst Quencher:

Homemade Water Filters

Water is something we take for granted but it can very quickly become scarce . . .

By Duncan Long

NEXT TO THE AIR we breath, probably no chemical is more essential to survival than water. Though water is something that we take for granted, it can very quickly become scarce through accidental pollution, chemical warfare, nuclear contamination, or terrorist poisoning. While most of us enjoy the luxury of being able to turn a tap to obtain relatively safe water to drink, that could all change in a few short hours' time thanks to an accident or disaster.

Even barring a major war or terrorist action, the problem of polluted water is growing ever larger. Many areas of the world (including parts of the U.S.) are discovering that their major sources of drinking water are becoming polluted. While there may never be a water shortage in most areas, there may be a shortage of water which doesn't create long-term effects such as damage to major organs or cancer.

While most large cities could filter such contaminants out, the "man on the street" isn't concerned enough to support the expense of doing this. Brandishing cliches like, "Everything causes cancer; it doesn't make any difference," may be reassuring for the short term. But people dying 20 years later from drinking water that's "safe" according to civic officials may give those brandishing such heads-in-the-sand expressions some second thoughts! The trends don't look good either: industrial wastes, agricultural run off, and effluent from sewage plants is showing up in drinking water in ever greater amounts.

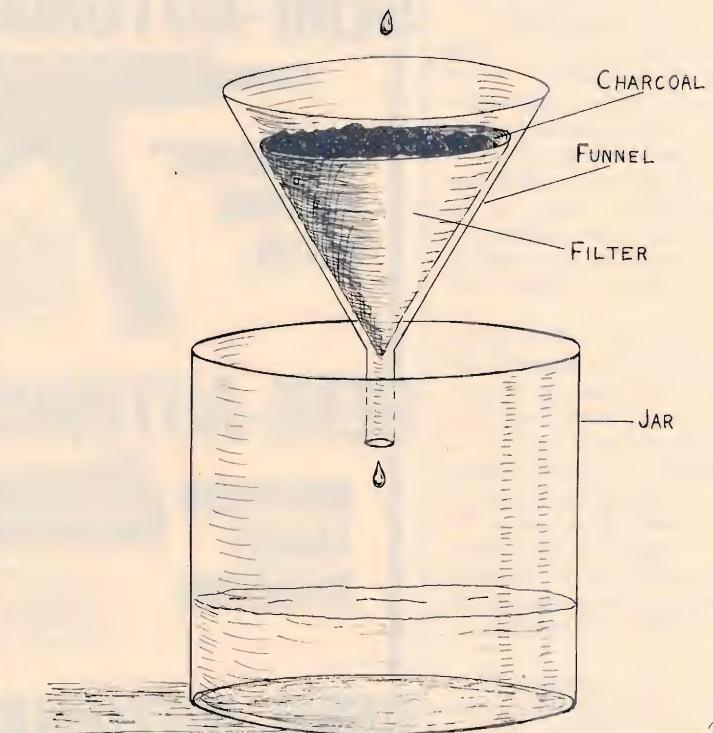
Distillation of water is expensive and does NOT necessarily get rid of many of these contaminants (much to the horror of owners of expensive distillation units). Many organic and industrial pollutants have boiling points higher than water. Unless complicated fractional distillation methods are used, all but salts and solid particles in suspension will boil out with the water and condense with the "clean" drinking water! Distilled water can be far from safe to drink.

The solution? A filter that takes out most of these contaminants.

The simplest route of obtaining such a filter is to run out and buy an expensive water filter. The "expensive" is what keeps most of us from doing this. Too, these filters require special cartridges and maintenance. And during a protracted disaster,

Figure 1

This is a simple activated carbon filter made with a large funnel, filter paper and a jar.



such filters may become inoperable in a few years', or even a few months', time. (And filters using activated carbon, as we'll see later, actually can become a source of contamination if not properly used.)

Homemade Filters—The solution? Simple filters that can be constructed and maintained by the user. While these are a bit more work, they can be kept going for some time and are flexible enough in design to be made from odds and ends in a disaster.

The heart of most water filters is activated carbon (also called activated charcoal). This material is created from coal or wood which has been processed at high temperatures with steam in the absence of oxygen. The processed wood or coal—activated carbon—is very porous and, when

broken into small particles, has a huge surface area. This allows the activated carbon to "latch onto" a number of chemical compounds so that they become bonded to its surface. Interestingly, activated carbon does not combine with oxygen or many compounds which are formed partly of oxygen (like water). This makes it ideal for use in gas masks and water filters.

Activated carbon bonds with a number of chemicals including many pesticides (including DDT and Deeldrin), many industrial chemicals (carbon tetrachloride, PCB's), heavy metals (lead, cadmium, etc.), and many of the dangerous chemicals created by industrial wastes during chlorination (including chloroform). If any material is tailor made for modern water pollution problems, it's activated carbon. carbon.

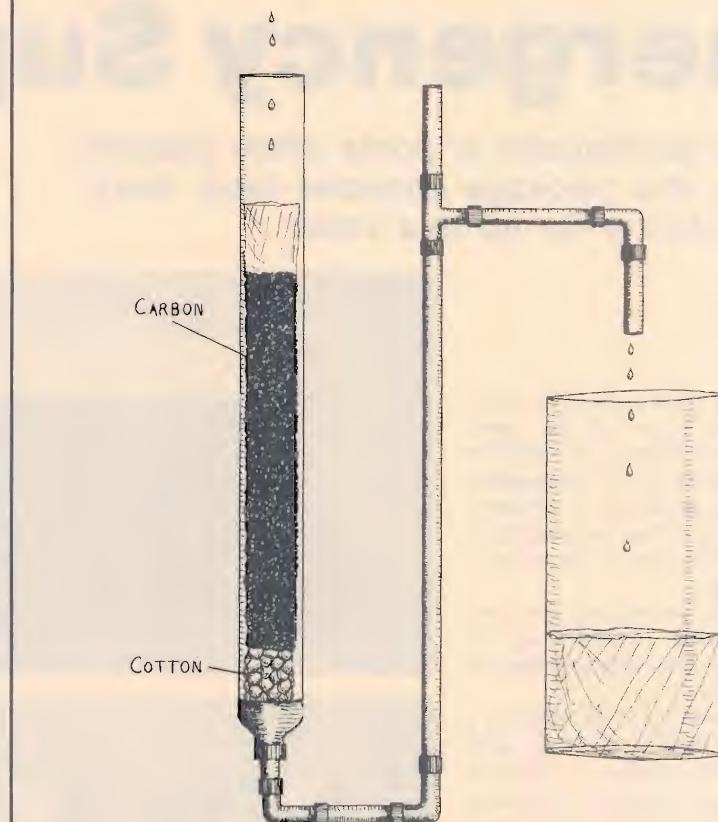
All's not perfect, however. Because the carbon works by bonding to chemical pollutants, it has a finite life. After a certain amount of water has gone through the filter and contaminants have been removed, the carbon will cease to remove the poisons. Continued use of such a filter would be dangerous. Unfortunately, since the human body can't detect such chemicals, there's no way of knowing when the carbon is saturated with pollutant without expensive testing equipment. Therefore, the user must be sure to replace the activated carbon regularly.

Another problem with carbon particles is that the shorter the exposure of the contaminated water to the activated carbon, the fewer impurities that are removed. This becomes an extreme problem when the huge volumes of water move through small filters (and is why many commercial units connected to household water supplies are next to useless). This means that, for an activated carbon filtration system to be effective, it must either be large or the volume of water going through it must be small; either route will work but one or the other is essential.

The third problem with activated carbon is that bacteria can grow on the surface of the carbon and—strangely enough—will often grow quite rapidly in the presence of some of the pollutants removed by the carbon. Thus, even if the carbon hasn't been saturated by pollutants, it still needs to be changed regularly to keep from creating biological contamination of drinking water. (With regular changing of the carbon in the filter, the levels of bacteria contamination are generally believed to be within safe limits for healthy individuals. However, the bacteria might adversely affect infants or those individuals who are sick or weak—which might be the case for everyone during a disaster.)

In such situations, it would be wise to sterilize the water after it has moved through the filter. Boiling the water—at a full boil—for 20 minutes is probably the best way to do this. Chemicals can also be placed in the water to kill bacteria; while this would seem to defeat the purpose of filtering the water somewhat, it actually is safer since chlorine or other water purification chemicals won't be able to bond with industrial pollutants, etc., to create dangerous byproducts. In addition to water purification tablets, two useful chemicals for sterilizing water are 2 percent tincture of iodine and sodium hypochlorite—the only active ingredient found in most household bleach. With 2 percent tincture of iodine, use 5 drops per quart of water; with 5.25 percent sodium hypochlorite solution—bleach—use 2 or 3 drops. Double the amounts if the water is cloudy or smells bad. The killing of the bacteria is not instantaneous; be sure to let the water stand for a half hour before drinking it. Of the two chemicals, iodine is

Figure 2
Here is a more complex and permanent water filter.



the most effective in killing bacteria; it also tastes worse. Therefore, most sterilization of drinking water is probably best done with sodium hypochlorite.

Cancer—Finally, there's some indication that continued exposure to carbon may cause cancer in the gastrointestinal tract. While the jury is still out on this, it's probably wise to limit carbon intake through your drinking water. Therefore, use a filter paper, coffee filter paper, cloth, or other "expedient filters" to remove particles of activated carbon that would otherwise find their way into the water (the filter also removes larger particulate matter from the water which is an added plus.) Another good practice is to "soak" activated carbon in a pan of water and wash off any carbon dust that may be with the larger particles of activated carbon.

A source of activated carbon is no farther away than your local pet store or five and dime: aquariums use activated carbon to clean up the water going through them. It's also possible, though a bit of a hassle, to make activated carbon by placing wood in a sealed container with only a very tiny hole in it and heating it until the wood is charred into activated carbon. Ideally, a tube leading into the container would be used to force water onto the wood to create steam inside the container though this is not essential. (The main considera-

tion is to not allow air to get to the charcoal when it's being heated while having a large enough hole in the heating container to keep it from exploding when the hot gases in it expand.) Complicated; but possible to carry out under very crude, post-disaster conditions.

Since activated carbon will also pull gases out of the air which it's exposed to, it's a good idea to seal the activated carbon in an air-tight container or plastic bag until you're ready to use it.

Construction—Once you have the activated carbon, constructing a filter can be quite simple. Probably the easiest to make can be created with a funnel, activated carbon, a coffee filter, and a collecting bottle (or can, cup, jar, etc.). Just line the inside of the funnel with the coffee filter, fill the inside of the filter with carbon, and drop water into the funnel. As the water slowly moves through the carbon, it becomes purified and drips out the bottom in a safe-to-drink condition (except perhaps for relatively benign bacteria). Boiling the filtered water will make it very safe to drink. (If you won't be drinking the water for a while, store it in a cool place like a refrigerator.)

The only things you need to be careful of when using this filter is to keep the water running very slowly through it (just a few

Continued on page 68

Inexpensive, Portable:

Emergency Supplies

Should an earthquake or some other disaster strike you, this package provides food, heat, light and shelter for up to a week . . .

Staff Evaluation

AFTER THE NEWS about the destruction and chaos of the recent severe earthquake in Mexico, SI's Bill Pier felt there was a need for an inexpensive, portable package supplying a minimum amount of food, light, heat and shelter for one person for seven days or for two persons for three days.

The result was SI's emergency seven-day supply. This package, combined with 10 gallons of water per person, provides the essentials for survival.

The unit and water could be carried in a car or truck or stored at home until needed. The supply includes an eight-foot tube tent, two space blankets, a portable stove and fuel tablets, eight candles (about 40 hours of light), water purification tablets, waterproof matches, a pocket first aid kit and a supply of military MRE food pouches and candy bars.

The food supply contains 21 retort pouches of meat entrees such as chili con carne with beans, chicken ala king, beef slices with barbecue sauce, and mennicotti pasta and beef in tomato sauce. There are also seven candy bars, 14 packages of dried fruit, 14 cakes, seven packages of beans with tomato sauce, and seven plastic spoons. Add to all this a good portable radio and your water supply and you have the essentials to get through at least the first 72 hours after a disaster—the time it usually takes to get most government emergency programs going.

An ASG staffer lived primarily off the food in the emergency seven-day supply package for three days and was well satisfied.

Some of the staffer's meals were heated in the new Zesto Therm SideKik food warming pouch (see facing page) and the rest were eaten cold out of the foil pouches the food comes packed in.

The evaluator said he felt fine after the three-day test, suffering no ill effects. In fact, to his surprise, he felt quite well nourished and even enjoyed the MREs provided by SI. There was not one meal he didn't care for, he said. He found these MREs far superior to some of the freeze-dried backpacking food he has used in the past, he added, and the next time he heads up into the mountains, the MRE foods are



ABOVE—This is the 18½- by 12½- by 7¼-inch box from SI containing the emergency seven-day supply of food, heat, light and shelter. It's easy to store or transport

LEFT—The food that comes in the emergency seven-day supply package includes 21 retort pouches of meat entrees, seven pouches of beans with tomato sauce, seven candy bars, 14 packages of dried fruit, and 14 packages of cake.



In addition to the food, the emergency supply provides two space blankets, eight large candles, waterproof matches, an eight-foot tube tent, pocket first aid kit, water purification tablets, and portable stove with fuel.

the ones he plans to take along.

The emergency seven-day supply package is available only from SI for \$49.95 each plus \$9.50 for shipping and handling, or three supplies for \$145 plus \$15 for

shipping and handling. The staff of ASG highly recommends the emergency seven-day supply as an adequate and fairly nutritious food source in an emergency situation. •

Zesto Therm:

HOT MEALS

Heating boil-in-bag and other properly sealed foods is a snap with the SideKik . . .

Staff Evaluation

THE SIDEKIK, as its manufacturer Zesto Therm states, "is a faithful companion to the outdoors person who has need for nourishing food and a hot drink on the run, or for survival against hunger and cold."

"The skier, adventurer, soldier, mountaineer, backpacker, hunter, fisherman, rafter, canoeist, balloonist, etc., should not be without this product. It provides comforting warmth while simultaneously providing a hot meal and/or drink."

A since discontinued throw-away Zesto Therm Food Warmer pouch was reviewed by *ASG* in the September 1985 issue and was considered effective for heating boil-in-bag foods. The firm is developing a new discardable food warming pouch but also sells two larger, reusable portable food heating containers, the SideKik and SofPak. *ASG*'s staff received a sample SideKik for evaluation and found it better than the discontinued Food Warmer.

The SideKik, weighs 7.6 ounces and measures 9½ by 8 by 2 inches outside and 9 by 7½ by 1½ inches inside. It comes in blue or olive green. It is made of sturdy plastic material which is not harmed by extreme weather conditions and resists tears and punctures. The SofPak is larger, measuring 9½ by 10½ by 4 inches outside, is made of the same material and comes in the same colors.

The SideKik is capable of heating to serving temperatures any foods which have been precooked, including freeze-dried, retort or shelf-stable foods, frozen single and twin boil-in-bag entrees, foods stored in Seal-A-Meal bags, coffee, tea, chocolate or soup, etc., in leak-proof zip-lock bags or other suitable containers, other precooked food, including canned food, soups and meats, provided it is transferred to a pouch that is leak-tight in boiling water.

To heat foods, drop the food sealed in an appropriate bag or other container into the SideKik along with a Zesto Therm Energy Pak and add about one cup of water. *ASG*'s testors found that adding about half again as much water as the recommended ⅓ to one cup of water produced the best results. After adding the water, the SideKik is closed by pressing the flap against Velcro fasteners. The SideKik is then supported in an upright position for 12 to 15 minutes. Then open

RIGHT & BELOW—To heat food in the SideKik, place food sealed in a bag or pouch and one Energy Pak inside the SideKik and add about one cup water. Close the SideKik and let stand upright for 12 to 15 minutes, then remove contents and discard the Energy Pak and water.



ABOVE—The SideKik comes with loops for wearing on a belt.

the SideKik and remove and eat the food in the bag and discard the water and Energy Pak (which contains a non-corrosive non-toxic chemical). The SideKik can be wiped clean with a damp cloth and stored for future use. It can also be used as a body warmer by pressing it with boiling water inside against the kidneys.

The SideKik carries a suggested retail price of \$19.95 and the SofPak sells for \$22.95. Energy Paks are \$4.50 for 5, \$8.50

for 10, \$15 for 20, and \$32.50 for 50. Polar Pads (possessing higher heating energy for freezing weather) are \$11 for 10.

For more information or ordering, contact Zesto Therm Inc., Dept. *ASG*, 10274 Alliance Road, Cincinnati, OH 45242; phone (513) 984-6611. The SideKik and other Zesto Therm products are also sold by mail-order companies such as SI, 2322 Artesia Blvd., Redondo Beach, CA 90278.

Protection, Cost:

Bomb Shelters Abroad

Many industrialized and developing nations consider civil defense and shelter building to be a part of this century's way of life . . .

By Marcel M. Barbier

(Marcel M. Barbier has a Ph.D. in electrical engineering (Zurich, Switzerland, 1950) and a Ph.D. in physics (Paris, France, 1954). He was radiation safety officer at the European Organization for Nuclear Research, Geneva, Switzerland, from 1964 to 1973, and has been a consultant on radiation hazards in the United States since 1973. His company, Marcel M. Barbier, Inc., P.O. Box 2905, Reston, VA 22090, was established in 1980 and designs and builds shelters—The editors.)

IT IS WORTHWHILE, at this point in time, to review on-going efforts abroad to provide protection for the civilian population in case of war. These efforts are done both by the governments and by the people themselves. The private share of the effort will be outlined for each country. It sometimes reaches 100 percent of the cost.

Soviet Union—In the Soviet Union, there is no private initiative and construction. The state does all. All passive defense and shelter activities, even those for the protection of the civilian population, are concentrated in the Soviet Department of Defense and constitute a service of the armed forces like army, navy, air force.

The armed forces have their own network of huge and massive shelters to house the political, military and administrative command posts in each subdivision and this network extends into all Soviet occupied countries (Keegan, 1982).

As regards the civilians, the major thrust of the Soviets is to protect their work force. There are shelter places at all factories for the complete workshift. Many of these factories are being rebuilt underground. For defense industries, the so-called "mirror-factory system" has been introduced (Kirshensteyn 1983).

Each defense factory located in a large urban area has its "mirror image" built out of town, in a rural area, about 50 miles from the original one, together with living quarters for the workers and their families. These factories are fully equipped in peace time already, but not working. Their designated manager and staff are those of the original factory. Thus relocation of defense industries to safer places can be done instantaneously, smoothly and in most cases without anybody noticing it.



A large urban Soviet shelter is under construction (Courtesy of the Journal of Civil Defense.)

In large cities huge collective shelters are being built (Goure 1981). Most large buildings have adequately built and equipped basements. These are now all being connected by galleries, so that escape is possible through other shelters if some entrances are blocked by rubble. In all cities where there is an underground railway network, all doors and stations are adequately designed and equipped to be utilized as mass shelters, as they were in World War II. In this respect the best known Moscow subway is both exemplary and impressive. Civil defense classes are mandatory in all schools and universities. Rural workers are trained in building fallout shelters throughout the country, for protection of people and also cattle.

Switzerland—The most impressive civil defense effort in a western country has taken place in Switzerland. In the early 1960s the Swiss passed a law requiring a shelter in each new construction; if you do not have an approved shelter on the plans, you do not get a building permit. The government gave a small subsidy for each shelter, but this was terminated in 1980.

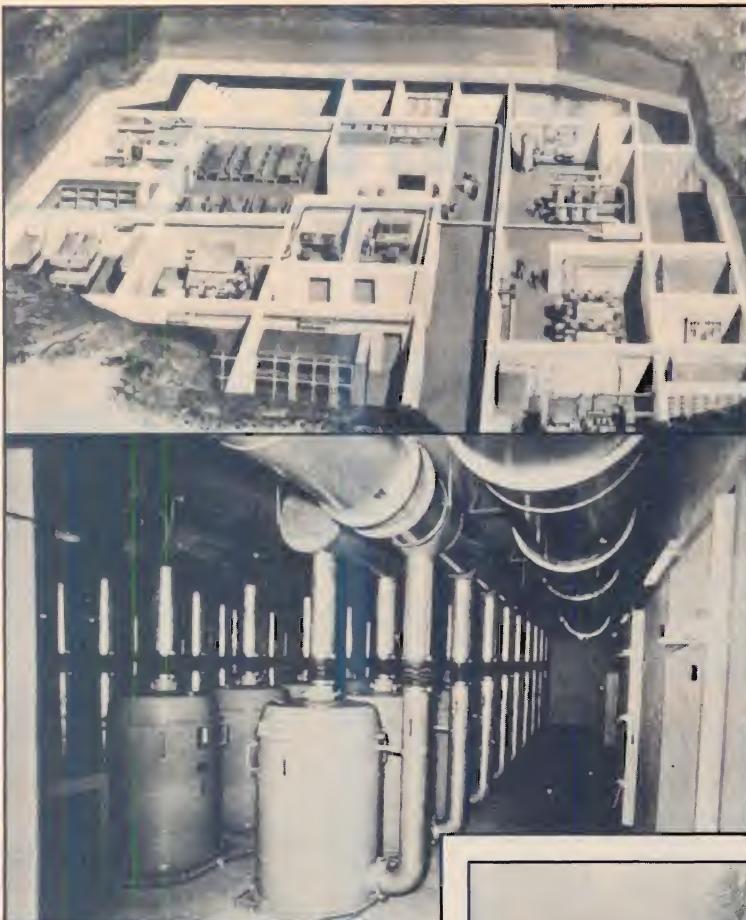
In the early 1980s the Swiss passed another law, requiring installation of a shelter in all older buildings built before

the previous law came into effect. It was officially estimated that 75 percent of the Swiss population had a shelter in 1984. The sizes of the Swiss shelters range from the single family shelter to a shelter for 20,000 people they have organized around a long highway tunnel (the Sonnenberg tunnel consisting of two 1,200-meter-long galleries), near Zurich, complete with hospital, police force quarters, emergency operations center, etc.

Sweden—Sweden is with Switzerland the country that has made the most conscientious efforts in civil defense. It is indicated that two thirds of the Swedish population now have shelters, the other third is living in rural areas remote from urban centers.

The Swedes build many of their shelters as above ground reinforced concrete structures, and use them as shops, classrooms, cafeterias, offices. They seem to put a lot of steel reinforcement in them.

Germany—In Germany, shelters are not mandatory. However, the government pays a subsidy that increases with the number of places in the shelter and is designed to match to a certain degree the additional cost incurred by the owner in strengthen-



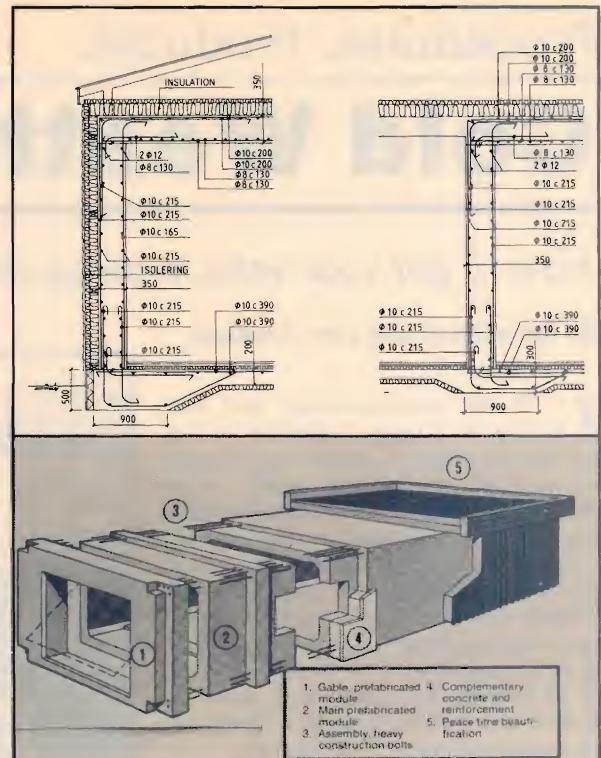
Here is a cutaway view of a large Swiss shelter and a picture of ventilation equipment in a large Swiss shelter (Courtesy of Luwa).

ing and equipping his basement. Shelter construction and equipment has to comply to types determined by the government.

French—The French passed a law in 1984 requiring every new building with a capacity above 100 people to have a shelter. The shelter should be a blast shelter in cities above 50,000 inhabitants and in specified areas, a fall-out shelter otherwise. It was also stated that the government would pay nothing.

Even before this law was passed, some French private persons had begun to organize themselves in civil defense groups or associations, which designed single family or small group shelter plans to be given their members for a nominal amount (G. Chevalier). The individual members then each hire their own builder to build the shelter on their own property, helped by experience shared by other members of the group. These shelters are generally of the rectangular concrete box type, utilizing imported Swiss blast doors, valves and ventilation equipment.

China—It was learned in the early 1970s that China had made major construction efforts in all large cities to build an extensive network of underground com-



These pictures show an engineering drawing of a Swedish above ground shelter and an exploded view of a Swedish prefabricated concrete shelter (Courtesy SCDA; Conplan).



A French single family shelter (Courtesy GBA Diffusion).



A Canadian nuclear shelter at the National Habitat Fair in Montreal 1985.

municating galleries and tunnels to shelter the civilian population in case of attack. Members of the American Civil Defense Association visited on various occasions such shelters both in Beijing and Dairen.

Middle East—There is a large activity in shelter building going on in the Middle East.

First there is a law, both in Israel and Lebanon, requiring all houses to have a shelter. These shelters have already saved many lives.

All warring factions have built extensive shelters. Huge shelters for people, weapons, ammunition and even trucks were discovered in Beirut, Lebanon.

The largest activity seems however to be currently concentrated in the Arab states of the Arabian Peninsula where the possibility of attacks from Iran is considered as a serious potential threat. There are in Europe about 40 companies building and selling shelters and shelter equipment.

They are all bidding for the Arab market. The contenders are the Finns, Swiss, Germans and Swedes. There was recently a Finnish-Arab workshop on shelter building and equipment held in Djeddah, Saudi Arabia.

Canada—Nearer to us, the Canadian government is serious about equipping government buildings and installations (such as airports) with adequate blast and/or fall-out shelters (J.C. Burnet 1985). Private persons are building individual shelters.

Conclusion—Obviously there are many both industrialized and developing nations which consider civil defense and shelter building to be a part of this century's way of life. They consider that it is technically possible to protect oneself effectively to a meaningful degree by shelters, and they put their money where their conviction is.

Procedures, Products:

Cold Weather Starting

How to get your vehicle going when winter sets in . . .

By Barry Smith and Jerry Younkins

IT IS NO understatement that cold weather is a serious adversary to any vehicle and greatly increases the demands on each of your car's or truck's major mechanical systems. An example of this is found in the effect of cold on a car battery, which can seriously reduce the output capacity. At 80 degrees F. the battery will produce 100 percent of its cold cranking amps but at 32 degrees F., the temperature at which water freezes, the power is reduced to 83 percent. At 0 degrees F. power is further reduced to 61 percent, and the battery will produce only 45 percent of its cranking power at -20 degrees F. The engine may require up to three times the amount of current for a cold start compared to one at 80 degrees F.

This article will discuss a number of procedures and products designed to speed cold weather starting and keep the tow truck out of the picture. The best policy in winter is to keep your car shielded from the environment. Unfortunately not everyone has a garage or windbreak but if you do have one winter is the time to protect that car or truck.

The next concern is how to start your vehicle in cold weather. The American Automobile Association recommends the following procedures. All electrical accessories should be shut off, then depress the gas pedal to the floor, release it and turn on your ignition key. Do not grind the starter for more than 20 seconds maximum. If the vehicle does not start, release the key and wait 45 seconds before making another attempt. If you smell gasoline, the carburetor is flooded. Shut off the ignition, depress the gas pedal to the floor and hold it down for one minute. With the pedal still depressed make another attempt to start the vehicle. Once the vehicle is started, warm at idle speed and do not race the engine while cold for it will cause severe engine wear. Consult your owner's manual for recommendations relating specifically to your vehicle.

Starting Fluids—As an adjunct to starting in very cold weather the driver may wish to use a starting fluid, of which there are numerous brands available, all primarily composed of dimethyl ether and light petroleum distillates. These substances will promote combustion at temperatures as low as -65 degrees F., at which ordinary gasoline will scarcely



Should your vehicle fail to start in cold weather, here's an expensive means of taking care of the problem.

vaporize. Some of the brands available claim to provide an upper cylinder lubrication in addition to helping start the vehicle. Procedure for usage is as follows.

Spray the throat of the carburetor or the air intake of the air cleaner with the starting fluid for two or three seconds, then attempt to start the engine immediately. If the engine does not catch repeat the previous procedure at least three more times. If unsuccessful after four tries, the ignition system should be checked for proper firing of the spark plugs.

These products are extremely flammable so keep them away from sparks or open flame and do not attempt to use them on engines with glow plugs. The admonition against use on engines with glow plugs is a good practice since the possibility exists of an explosion occurring when the volatile starting fluid in the intake manifold contacts the red hot glow plug in the cylinder.

Battery Problems, Jump Starting—At one time or another most motorists have experienced the frustration of exiting from

work or shopping and finding that their battery has been drained due to leaving the lights or other accessory on. This is not the time to panic or to call an expensive towing service but to pull a set of good jumper cables out of the trunk. It is not that difficult to persuade a passing motorist to lend some of his starting juice to you. However in order to prevent damage to either vehicle or to your person the following method is recommended.

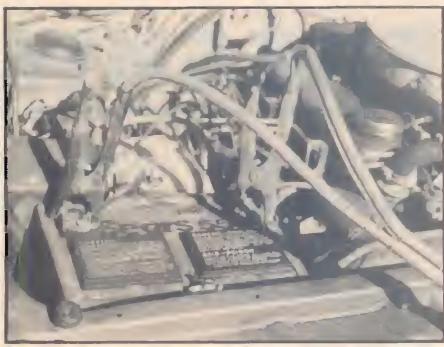
Park the vehicle that is providing the boost within reach of the jumper cables, providing enough slack to prevent tension on the battery terminals but ensuring that the bumpers of the two vehicles are not touching. Isolate the positive clamp from the negative clamp at the dead vehicle ends of the cables and then attach the other ends to the positive and negative terminals on the good battery, paying close attention to polarity. Next connect the positive lead to the positive terminal of the dead battery. Connect the negative lead to a heavy bare metal structure on the engine itself if possible, taking care to route the cables away from the fan or other moving



When jump starting, make sure the bumpers of the vehicles involved do not touch.



After ensuring that the free ends of the jumper cables are not touching, connect the other ends securely to the terminals of the boosting battery.



ABOVE—Connect the positive (check polarity carefully!) clamp from the boosting battery to the positive terminal of the dead battery.



ABOVE RIGHT—Secure the negative clamp from the boosting battery to a heavy steel part on the engine block well away from the battery on the vehicle receiving the boost.



RIGHT—Check the lay of the cables to be certain that they are clear of the fan or belts of each engine before starting.

parts on either vehicle. You are now prepared to start the engine on the "good" vehicle. Let this engine run for a minute or two to get the dead battery partially charged. Next start the dead vehicle. If it is still dead check the connections on the battery and cable for good contact with bare metal.

The purpose of isolating the two vehicles is to allow the final connection at the dead car to be away from the battery. This prevents the possibility of hydrogen gas which can collect around a battery from being detonated by sparks from the jumper cable connection. Cheap jumper cables may leave you as stranded as if you had none, so select a good set of tangle-proof cables and keep them in your vehicle as you would a spare tire and jack.

A word of caution to you good Samaritans who provide those much needed jumps. Insure that the battery voltages are compatible. Both batteries must be either 6 or 12 volts. In general most cars built after 1955 will have a 12 volt battery. When in doubt, ask.

It should be noted that some vehicles will have a red and a black cable attached to the battery. Do not automatically assume that this is a color code for positive or negative. Look for +/− signs on the battery or follow leads to determine positive and negative.

Fuel System—The fuel system can stop you dead on frigid mornings, since condensation which settles in the low spots in the fuel tank, lines and filter can freeze and cause a fuel blockage, starving the engine for fuel. You may wish to use a gas line antifreeze such as Heet or an equivalent product. These act as fuel system dryers by absorbing moisture and converting it into a combustible form. Regular use can also keep the carburetor and choke free of gum, varnishes and carbons which are more easily built up during winter months.

Ignition System—If perchance the engine tries to start but you encounter sputtering and backfire when you attempt to start it it is possible that condensation has built up in the distributor cap. Remove the cap and dry it with a soft rag taking care not to scratch the inside of the cap. A scratch in there can instigate either misfires or crossfires. You may also purchase a spray for electrical engine systems which can dry condensation in seconds.

Electrical Appliances—Currently on the market there are many products designed to warm motor and battery when stopped overnight in sub-zero weather. One is an indispensable little device that plugs into an extension cord and provides two three-prong outlets for motor heating equip-

ment. It only activates during temperatures of 20 degrees F. or lower.

The next item you may wish to consider is a battery warmer blanket which averages between \$20 and \$40. It uses as much electricity as two 100-watt light bulbs. By heating your battery it provides a much easier cold start. Another product is an oil or coolant heater for the engine itself. These come in many varieties from an inexpensive 18-inch immersion heater that replaces the dipstick in your oil (\$10 to \$15) to a 3,000-watt water circulation heater which is installed as a freeze plug replacement. The varieties which would be right for your particular vehicle might be recommended by your car dealer or parts store.

There are even plug-in heaters which are attached by a powerful magnet to an oil pan or engine casing and can supply up to 300 watts of warmth to your oil. Some heaters are inserted in the lower radiator hose (not recommended for diesel engines) or in a heater hose. The difficulty of installation varies from product to product and the convenience of use and power requirements are often reflected in the price. Again consult with a parts supplier to find correct devices for your locale, vehicle and mechanical ability. There is no longer any excuse for poor winter starts if you will do a little homework and maintenance. •

Part V:

FRESHWATER FORAGING

As with other endeavors, in learning to fish experience is the best teacher . . .

By Richard Colagiovanni

(This article is from a multi-part series on the techniques and equipment involved in capturing fish and other protein sources in their North American freshwater habitats —The editors.)

IN ANY ENDEAVOR or occupation, experience is the best instructor. Freshwater foraging is no exception. To develop actual experience usually takes months, years to accomplish. Practice "hands on" as much as possible. For the neophyte or moderately experienced angler, I've compiled information that will aid in fish capture.

Don't overlook farm and neighborhood ponds in urban/suburban locales as possible food sources. Determine availability of food species as well as estimating potential yield of fish production (protein). If watershed is questionable due to possible industrial/domestic/institutional pollution, have a representative sampling of fish analyzed by a reputable laboratory if the site is a food source provider in your survival food plan.

Weed and farm crop stalks are good suppliers and storage facilities for freshwater fishing baits. Corn stalks and weed stems harbor larval stages of insects that are in top demand by trout and a variety of pan fish (i.e., bluegill, crappie, perch, etc.). The harvested stalks remaining in the field or about farm feedlots are simply slit open and the larva is extracted. Ragweed, goldenrod and other weed types usually exhibit swollen or enlarged bulbous features along the stem (about the size of a thimble). Cut 'em open to obtain the larvae ("grubs"). In colder climates, if space permits, the vegetative stems and stalks may be stacked or boxed as a source of bait self storage.

Water clearness or visibility is a critical factor in hook & line capture of food/game fish. Fishery scientists call this phenomenon turbidity, assigning a numerical factor to measure the amount of suspended/dissolved materials present in the water column. The targeted fish, in many instances, feeds primarily by sight. In clear or relatively clear water situations (visibility 4 to 6 feet or more), subdued or natural colored (grey, brown, black, natural fish patterned) lure plugs, bronze, black,

copper or gold spinners/spoons provide sufficient color transfer or flash to solicit strikes. In more turbid waters, bright fluorescent, iridescent and light-absorbing colors on plugs, spoons, spinners offer a better fish attraction. In addition, in more colored (turbid) waters (i.e., muds, silts, algae blooms, tannic swamp stains, etc.), sound and scent play vital roles in fish capture. Sonic waves produced by rotating spinners, oscillating spoons and sound chambered plugs (providing a noise usually created by BB shot), give the "dirty water" fish an additional source to home in on. Many fish that feed basically by sight (e.g., largemouth bass) can hear a lure or bait many feet beyond their sight limit. Live fish baits, including shiners, mummies, small panfish, frogs, etc., produce natural sounds that fish will respond to.

Scents play a very important role in fishing turbid waters. Obviously, live and dead baits exude natural oils and fluids that penetrate the water, either by current, or molecular travel or dispersal in "standing" waters. A hunk of decaying fowl gizzards, placed on a catfish trot(set) line on a sluggish river will penetrate and "call" fish for at least several hundred yards downstream. The same bait arrangement might penetrate a 50-foot radius in a standing water pond.

Other scent options to aid murky water fish capture include the rubbing of natural bait of food on artificial lures or even the use of commercially available (and easily stored by survivalist anglers) liquid fish scents. These scents are available in a variety of "flavors" either in spray form or liquid.

When foraging small to medium size wadable streams, try to head upstream against the current to avoid spooking or alarming the resident fish. This action avoids stream bottom silt/sand from your progress preceding you. In addition, wade as quietly as possible. Avoid heavy underwater footfalls that produce fish alarming vibrations, as well as concentric surface ripples that will notify fish of approaching danger. On the visibility scene, avoid shadows and fast body movements. Wear somber colored attire (i.e., camos suitable for wooded streams), and try to break one's outline with shore vegetation, rocks, or other available structure.

Casting—A quiet, undisturbing approach to fish holding areas is vital to fish capture in most instances (via wading, shore, boat). After this is accomplished, in rod and reel fish capture how one "attacks" or "addresses" the water will determine the *yield* of a given site before the casting, fish playing activity (combination) will "shut 'em down." Experienced anglers fish the closest potential lies (fish holding sites) before lengthening their casts.

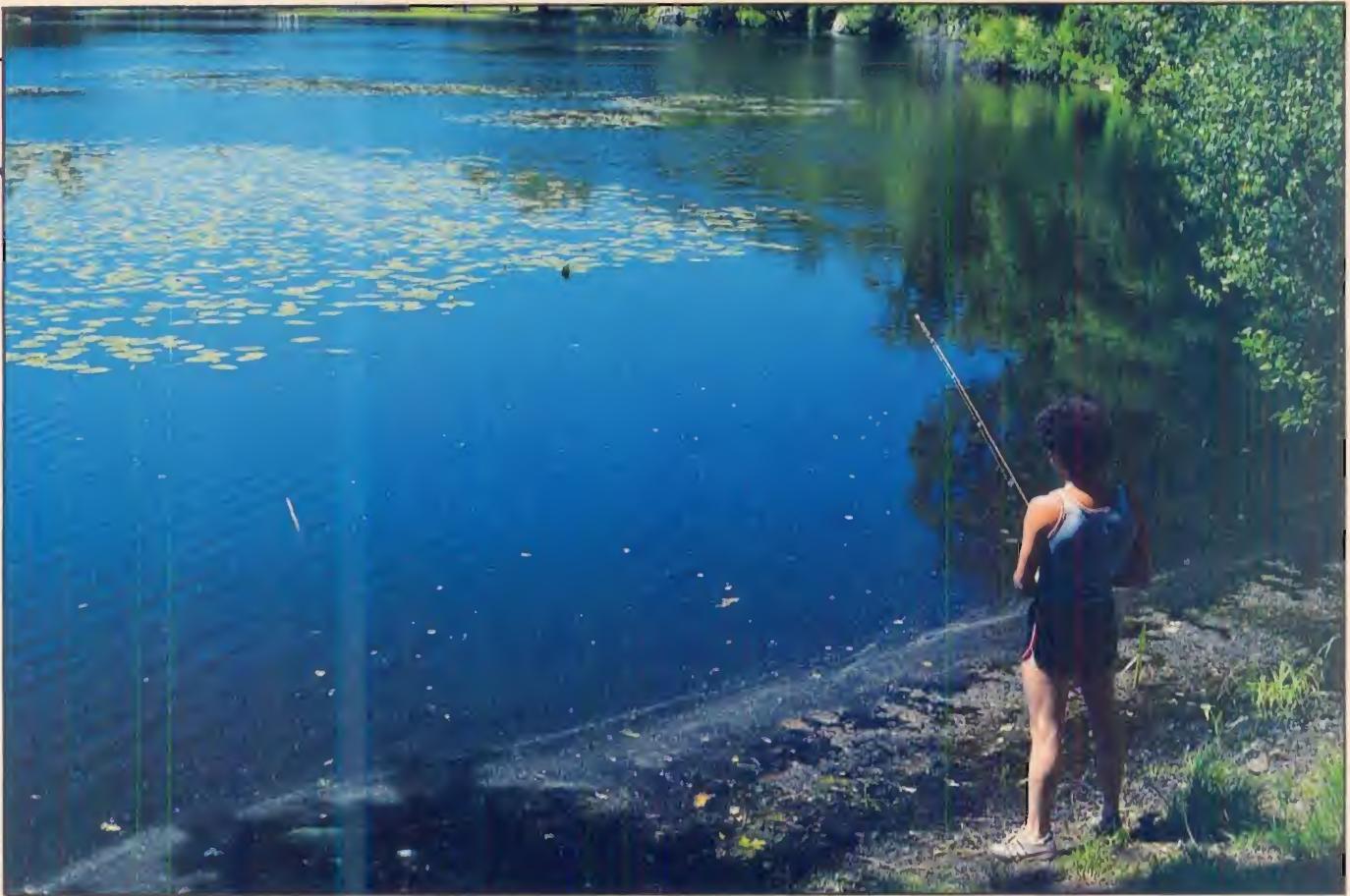
Makeshift lures/flies can be fabricated from short 1½- to 3-inch sections of colored yarns, fluorescents included. Simply tie with thread (or wrap with soft wire to achieve greater depth). These can be casted, jigged, drifted, etc., depending on the amount of weight added, and style of hooking arrangement. Also, don't hesitate to add commercial fish scents/oil to the absorbent yarn. If not available, grind up a few minnows/worms into a watery paste. Soak the "yarn lures" in it. Resoak during fishing excursion. Water will wash or dilute it.

Line (leader) size may be increased in cloudy (turbid) waters, at night, and in moving waters—streams and wave jostled lakes in many instances. The clearer, quieter, shallower, and less wave jostled waters, along with increased lighting (clear skies vs. fog/overcast) days might dictate the need for lighter lines.

Singular fish (or small groups) tend to be more selective and spooky than large schools. The larger groupings of fish tend to be more aggressive. The internal competition is to grab the bait before their cronies do. The large numbers also provide for a sense of security.

It is essential to try a variety of colors to solicit strikes. Don't be afraid to try a half dozen or more (if available) lures until the proper one is found.

If time allows, a daily "fish diary" is an excellent assistant in planning fishing forays. Data that should be recorded include locale (pond, stream, etc.), date, time of day, weather conditions (if possible include air temperature, barometer, wind direction and velocity), and water conditions (temperature, amount of turbidity, wave heights, stream velocity) as well as listing the successful baits/lures, type and amounts of fish caught and any additional



The type and conditions of the water body tell the angler much about what fish might be present and how easy or difficult it will be to capture them.



Water clarity (turbidity) greatly affects fishing prospects.



Don't overlook farms and neighborhood ponds as possible sources of fish protein but check for pollution problems.

fishing technique that produced.

On more open waters, such as large lakes/wide rivers, productive fish producing sites away from the shoreline, you need a way to mark the action. A colored ball, or bleach bottle rigged with a stout cord, attached to a heavy weight (rock, scrap metal, large lead sinker) can be used.

When trolling for salmon, trout, etc., a certain boat speed might be the only productive one, e.g., 3.8 mph. A device called a Accu-troll does it nicely. The consistently successful troller relies on his ability to

know everything he can from water depth to water temperature. This device allows calculations of exact trolling speed the instant a fish is captured so the speed can be duplicated precisely. It mounts on the boat in any position and determines the true trolling speed of the boat regardless of wind effects.

An electric outboard motor (trolling) has serious fishing possibilities for powering small craft (canoes, johnboats, etc.), as the need of fossil fuels (gasoline) is eliminated. Storage batteries used to power the

craft can be recharged by wind/water/solar systems. Recommended motor brands include Motor Guide, Shakespeare, and Mini Kota. Select models with adequate thrust/amp draw to suit your particular needs. Also, these motors are essentially silent in operation—a plus for operation in less than ideally secured locales.

Artificial reefs positioned by anglers on a given body of water can improve fish spawning and rearing areas, as well as creating a "fish magnet" that concentrates

Continued on page 62

Spectrum:

Radio For Self Sufficiency

In a disaster, one of the first modern conveniences to go will be the public communications system.

By Thomas D. Cox

MODERN CONVENiences . . . They are so much a part of our lives that most people take them for granted. Not most *ASG* readers, though. We know those conveniences tend not to be there when we need them the most, whether it's after a car breakdown on a deserted road, or in the wake of an earthquake or hurricane. One of the first conveniences to go will be the public communications system. If Ma Bell's apparatus withstands the initial shock, the system will quickly jam as everybody tries to call everybody else at the same time.

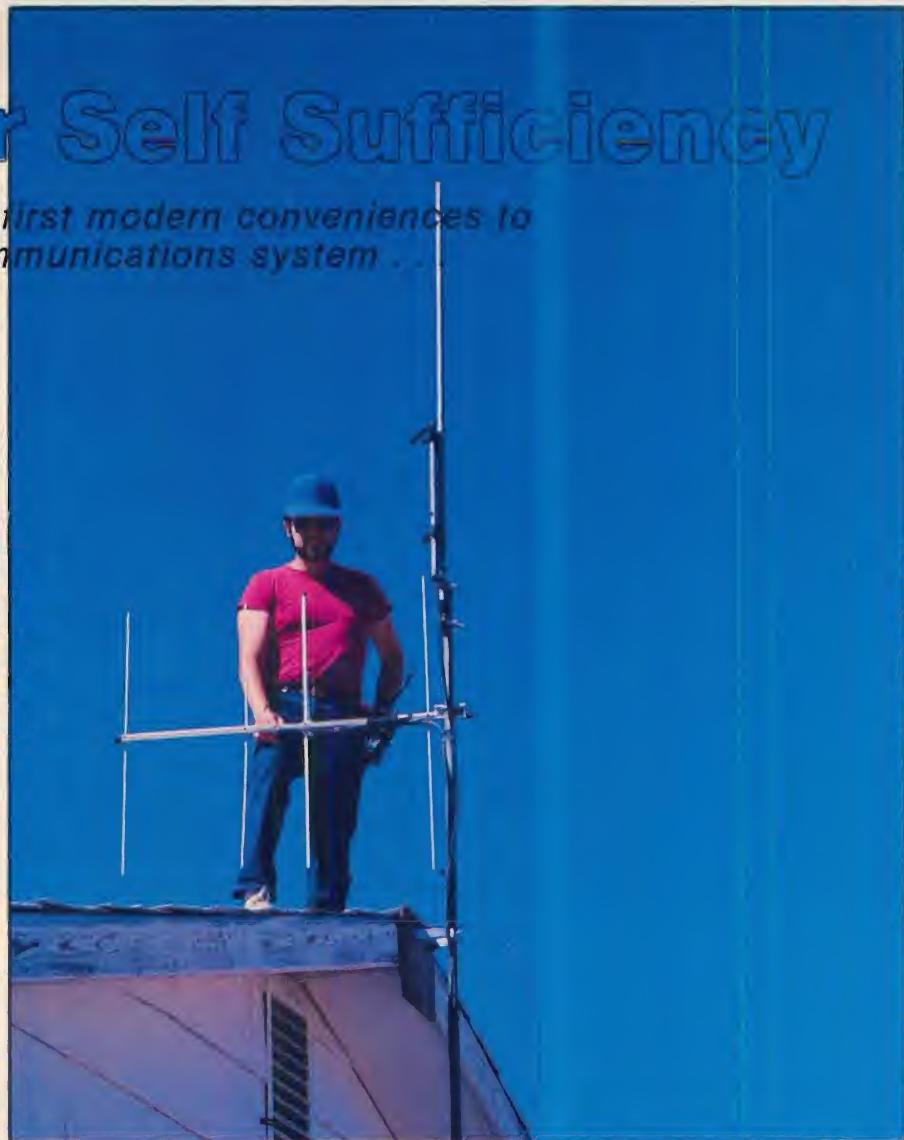
Earthquakes and hurricanes tend to pull the plug on communications for quite a while; and getting people out of the rubble of fallen buildings takes precedence over repairing downed telephone lines and putting up new towers at broadcast stations. The few working radio stations are likely to be in the hands of the government and the military, and will be swamped with emergency traffic. Where does that leave us? If we've done our homework, we can rely on our own two-way radio system to carry the important messages.

The time to do this homework is now. You wouldn't wait until you heard that dry rattle at your feet to learn about first aid for snakebite, would you?

What's the "perfect" means of radio communication? CB? Shortwave? Morse code? Single sideband? Radioteletype? Sad to say, there isn't one. Every one of these types of radio communication is superior to the others in one set of circumstances or another, but none of them alone can meet your every communications need.

That means we have to compromise, and also means that more than one type of equipment should be on hand. The first job before us is to identify our communications needs. How far away do we need to be able to talk? How many people do we need to talk to? How important is the security of our transmissions? How much space and weight can we set aside for communication equipment? And certainly not the least of our worries, is: How much is it going to cost?

Radio—Let's tackle these questions one at a time. First, how far? At ranges from a few yards to a few miles, radio can be a



The author holds a directional antenna ("beam") made for the two-meter Amateur band. This antenna concentrates the signal in the direction away from its mounting point. A non-directional two-meter antenna is mounted above.



A small two-meter mobile antenna is mounted on the roof of this vehicle. Either the mobile transceiver or the portable may be operated using this antenna.



The two-meter portable Yaesu FT-208R weighs a little over two pounds and operates on any of 800 channels. Here it rests in its charger/power supply.



Rick, KA5HWD, is at the controls of a computer-operated HF station. Rick has limited use of his hands, which makes the screen display of incoming messages very useful.



Three types of keys for producing Morse code are from left, an electronic keyer, a simple key of World War II vintage, and a mechanical keyer at least 50 years old.

simple time saver or an absolute life saver.

In day-to-day activities, radio can help friends and family members keep track of each other at short distances—across town, or from car to car on the highway, for example.

When long distance telephone service is not available, the ability to keep in touch with friends and loved ones thousands of miles away by radio can be a great morale booster. And for ships at sea and expeditions to remote locations, long range capability is an absolute necessity. Unfortunately, no one piece of radio equipment or portion of the radio frequency spectrum can be counted on to meet all short distance and long distance needs.

Let's define a few terms that are helpful in any discussion of radio. A fundamental characteristic of a radio signal is the number of alterations of polarity the signal goes through in a second. It is called "frequency," and is measured in Hertz (Hz), which used to be called cycles per second. For example, household electric power in the U.S. is a 60 Hertz alternating current, meaning that the flow of current in your house wiring changes direction 60 times a second.

"Wavelength" is another term you will see in discussions of radio signals. Radio signals are invisible, but if you could "see" a cross section of a radio signal, you would see a series of wave shapes, made up of peaks and troughs. Each peak and its accompanying trough make up one wave, and the distance from the beginning of each peak to the end of each trough is one wavelength.

Radio waves get shorter as the frequency of the signal increases. While they all travel at the same speed (the speed of light), the number of waves passing a certain point can only be increased by shortening the waves.

The term "short wave" is left over from the early days of radio, when all activity on radio took place at low frequencies, or long wavelengths. The part of the radio spectrum from 3 million to 30 million Hertz was then a new frontier of experimentation

at the higher-frequency end of this region, and thus the short waves.

It's convenient to use some prefixes to talk about higher frequencies: 1,000 Hz is 1 kiloHertz, or 1 kHz. 1,000,000 Hz is a megaHertz, or 1 MHz. 1,000 MHz is 1 gigaHertz (GHz), and that's as high as we need to go.

The spectrum has been arbitrarily divided into low, medium, high, very high, ultra high, and super high frequencies. These groups of frequencies, or "bands," make for more convenient labels when we are talking about different portions of the spectrum. For a brief summary of the parts of the spectrum we will be dealing with, refer to the chart entitled, "A Map of the Radio Spectrum" on page 58.

CB—The first thing most people think of when they discuss two-way radio is CB, Citizens Band, or what the federal government calls "Citizens Radio Service, Class D." Popularized by movies and music, and made accessible to everyone by inexpensive Japanese radios, CB is by far the most common means of two way radio communications in the United States.

But like a lot of fads, the image of CB offers a lot more than it delivers as a way of communicating by radio. Because of the frequencies used, and the lack of close regulation, CB should not be relied upon as a primary means of getting a message through by radio, although CB equipment should be available as "backup" where the working range does not exceed a few miles.

CBers carrying on short range conversations with neighbors may experience interference from stations a thousand or more miles away, whose operators are simply trying to carry on neighborly conversations of their own. While this may be something of a novelty the first few times it happens, it will soon become an annoyance if the distant signals are strong enough to make local traffic hard to understand.

This phenomenon, referred to by CBers, as "skip," results from changes in the outer layers of the Earth's atmosphere. These changes cause signals of some fre-

quencies to be soaked up, while signals at other frequencies are bent back to the Earth at a distant point, hundreds or thousands of miles away. Sometimes these reflected signals are so strong that someone listening to a receiver which happens to be in the right spot would swear the signal had to originate in his own neighborhood. Likewise, when two CBers near the limit of range of their equipment try to converse, the same phenomenon may cause their signals to pass miles above each other's antennas, making contact impossible.

The only way to use CB without your communications being vulnerable to this kind of interruption is to restrict your use of CB to short distances—no more than five miles, if you need a reliable, full-time link. Antennas for CB need to be most sensitive to signals from nearby, and should be able to reject signals returning to earth from a trip through the ionosphere.

Another factor needs to be considered by anyone who will be relying heavily on Citizens Band for communications, and this has nothing to do with equipment or the behavior of radio signals. There are no accurate figures, but there are as many as 10 million CB radios in the U.S.

While most of them are in the hands of reasonable and mature individuals, the lack of any licensing or examination requirements means absolutely anybody can buy (or steal) a CB radio and proceed to transmit almost anything he pleases, any time he pleases.

The Federal Communications Commission (FCC) regulates CB, as it does all the other two-way radio services, but its enforcement resources are not infinite, and they would almost have to be infinite to enforce the very few rules concerning CB operation, considering the sheer volume of CB traffic.

This lack of discipline (compared to Amateur Radio and the commercial and public safety two-way services) means chaos often reigns on CB. The same rules that make CB so accessible and democratic, can also make it useless.

Continued on page 58

Slingshot Blowgun:

Dart Power

The Mega Dart MX-7 Power Dart Gun fires its steel missiles at more than 720 fps . . .

Staff Evaluation



ABOVE—The MX-7 Power Dart Gun is about 30 inches long without the shoulder stock and about 43 inches long with the stock.



ABOVE—The shoulder stock allows a steadier hold of the dart gun.



LEFT—The top MX-7 dart shown here is fitted with a plastic hunting tip. Mega Dart, Inc., has developed a shorter, heavier dart (not shown) for better killing power in small game.



To load the MX-7 the bolt safety is opened and drawn back, a dart is placed in the loading chamber and the bolt is closed and locked.

DEIGNED FOR target shooting and small game hunting, the Mega Dart MX-7 Power Dart Gun looks vaguely like a rifle and operates as a combination slingshot and blowgun.

But this camouflaged hard plastic and steel weapon is no toy. It fires .40 caliber

steel darts with razor sharp points at a velocity of more than 720 feet per second which can travel to distances well beyond 50 yards.

The thin steel dart shafts have optional plastic hunting tips. At their opposite ends, .40 caliber orange plastic cones are

attached. The dart shafts measure about four inches long but Mega Dart, a Wells Fargo Company, is producing a new shorter (three inches) and heavier dart shaft which the company claims gives the user greater foot pounds of energy for better killing power in small game. An

Darby Brothers Get Acquainted Sale



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Black 440 Stainless Steel Blade with Hollow Handle. Includes Compass, Emergency Kit, and Sheath. Reg. \$37.50. Now...

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This survival belt could make the difference between surviving or dying. Designed, developed and field tested by a certified disaster Survival Instructor.

Keep one in your shelter, auto, etc. or wherever you find yourself in the event of a disaster.

A must for hunters, campers survivalists and those involved in war games.

Items included:

- 1 - Survival knife w/compass
- 1 - 30 piece fishing kit
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Many other essential items



If purchased separately, the items contained in this unit would cost over \$100.00. Contains 100 and 1 pieces. Stock #1001. \$49.95.

PTE® a nontoxic, noncorrosive spray treatment that will fire retard an average area of 360 sq. ft. \$49.95 per gallon.

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Allow 4 to 6 weeks delivery.

MEGA DART MX-7 POWER DART GUN: TECH SPECS

Mechanism	Bolt action
Caliber40
Ammunition40 caliber MX-7 darts
Weight, pounds	4.5
Overall length, inches	29
Rear Sight .	Tube with adjustable elevation
Front Sight	Ramped blade
Power source	Pneumatic pressure multiplier

Manufacturer . . . Mega Dart, Inc., Dept. ASG
11900 Montana Ave.
El Paso, TX 79936
Telephone: toll free (800) 351-2274;
In Texas, (915) 593-1115

experimental paint marking dart has also been developed for the MX-7.

Mega Dart additionally offers the MX-7SS shoulder stock for increased gun control and accuracy. The stock is made of non-reflective black-finished steel rod.

A sight tube adjustable for elevation and range is mounted atop the MX-7 just in front of the loading chamber.

Operation—To operate the MX-7, the bolt safety is opened and pulled back by either hand of the shooter and a dart is placed in the loading chamber. The bolt safety is then pushed to the closed position and locked.

Then holding the grip of the gun, the shooter draws back the power handle until a clicking sound is heard and the handle locks in place in the cocked position.

The weapon is aimed at the target by placing the top of the front blade sight at the six o'clock position of the target. The top of the front sight should be centered in the rear sight tube picture.

Just as with a regular firearm, the trigger is slowly squeezed to fire the MX-7.

The rear sight adjustment screw is turned clockwise to make the dart hit higher on the target and counterclockwise to make the dart hit lower on the target.

When the trigger is squeezed the cocked power handle is released, driven forward by the power bands which girdle the handle and are attached to cross bars just in front of the trigger guard. The power handle is essentially a piston which, when driven forward by the power bands, forces air up through an opening in the loading chamber just behind the dart. This rush of air propels the dart down the barrel and toward the target.

Evaluation—The MX-7 seemed somewhat heavy to some shooters who tried it. The weapon weighs 4.5 pounds without the shoulder stock. These shooters complained of some difficulty in holding the gun steadily to sight the target adequately after a number of shots. The shoulder stock aids shooters by helping to steady the weapon but appeared to be most useful to those shooters with longer arms. Without the shoulder stock, the gun is fired in pistol fashion by holding the hard plastic grip.

The manufacturer states that the MX-7 has an effective range of 50 yards. On testing, this magazine's staff found that the most effective range was about 35 yards or

RADIO FOR SELF SUFFICIENCY

Continued from page 55

Ham—How about the short waves? The only practical way for the average citizen to gain access to the HF band is by getting an Amateur Radio Service license, commonly known as a ham license. The only exception is a small segment between 26 and 28 MHz, which is where CB is found. While most of the HF band is subject to the same uncertainty of signal behavior common to the CB portion, it is possible to choose a frequency within one of the HF Amateur bands that will carry a signal the desired distance.

This portion of the spectrum has been studied so thoroughly that there is a high degree of predictability of the propagation of a signal on any of the HF Amateur bands at any time of day. While reliability is high over ranges of a few hundred to several thousand miles, very short distance communication is still somewhat hit or miss.

At VHF and UHF frequencies (30 to 3,000 MHz) however, short distance communication becomes much more reliable. That is why police departments and businesses which must rely on short range communications to carry a large volume of messages use these frequencies. Antennas are also typically smaller at these frequencies, which helps to reduce the size of the equipment package. If you want to be able to talk to others during field operations such as hunting or survival games, this is the part of the spectrum you should consider.

The popularity of these bands means there is a lot of high quality equipment available at reasonable prices. As technological developments make better gear available, equipment which is in good condition but is obsolete appears on the secondhand market, sometimes for a tiny fraction of the cost of the same gear when it was new.

While a large selection of Amateur gear is available in the VHF and UHF range, a lot of radios that saw service in police departments or business are also available. However, the later must almost always be adjusted by a qualified technician who knows the equipment and has the necessary test instruments to make them work on the frequency or frequencies you will be using.

Part of the appeal of used Amateur gear is that anything manufactured in the last 10 years is probably capable of operating on any of several frequencies within a given Amateur band, or even over the entire band. Most commercial gear is made to operate on one or two frequencies for which the FCC has licensed the owner. Along with how far away we will want to talk, we need to consider the number of people we want to talk to—or to hear us talking. The low price of equipment and

large number of users makes CB a good bet if you just want to be sure that there will be somebody out there to talk to.

However, propagation and operator training make the quality of the conversation and the location of the other station something of a gamble. And if anything you have to say is the least bit confidential, CB is like putting it in the newspaper. We are better off to be a little more selective about our "audience" than we can be with CB alone.

I have a VHF Amateur radio mounted in my vehicle and carry a "portable"—a hand-held unit—that covers the same frequencies. The band used is known as "Two meters," or 144 to 148 MHz. This is a very popular ham band, with performance similar to that of the VHF band used by police and fire departments and businesses outside the large urban areas of the U.S. Short range (up to 10 to 15 miles) communication is possible between two portables using very low power and small antennas, if the terrain between the units is suitable. If both operations can find higher ground that increases the distance to their visual horizons, range can be considerably increased.

Another great appeal of the Amateur two-meter band is the widespread use of repeaters. A repeater is a combination of a receiver and a transmitter that is automatically operated, and usually located on a high spot, such as a mountain top or on the tower of an existing radio station. The receiver listens on one frequency all the time.

Signals strong enough to be picked up by the receiver are passed on to the transmitter, which simultaneously retransmits them on a slightly different frequency. The result is that stations over a large area, without powerful transmitters, can hear and be heard by other stations listening on the repeater's transmit frequency, even though two stations might be too far apart or separated by an obstruction that would keep them from making direct contact.

Thus, I can stand in my front yard in southern New Mexico and, by using the frequencies of one of several repeaters within 50 miles, use a quarter-watt (a CB radio transmits with about 4 watts) signal from my portable to talk to stations located over most of New Mexico and Arizona, as well as west Texas. It is also possible, using

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A MAP OF THE RADIO SPECTRUM

RANGE	NAME OF BAND	PRINCIPAL USES & POINTS OF INTEREST
30 KHz to 300 KHz	Low Frequency (LF)	Ship-To-Ship & Ship-To-Shore; Air And Sea Navigation Beacons; Govt. & Military Weather Stations; One-Way Naval Traffic To Submerged Submarines
300 KHz to 3,000 KHz	Medium Frequency (MF)	Navigation Beacons, US AM Broadcast Band (535-1,635 KHz), Lowest Amateur Band, Regional Broadcasting Outside of USA
3,000 KHz to 30 MHz	High Frequency (HF)	International Shortwave Broadcast, HF Amateur Bands, Long Range Govt, Military & Commercial 2-WAY; CB (26.925-27.405 MHz)
30 MHz to 300 MHz	Very High Frequency (VHF)	Short Range 2-WAY, Mostly Mobile & Handheld—Federal, State & Local Govts, Commercial, Industrial & Private 2-WAY Systems; US FM Broadcast, TV Channels 2-13, Satellite Communications VHF Amateur Bands; Private & Commercial Air Navigation
300 MHz to 3 GHz	Ultra High Frequency (UHF)	Short-Range 2-WAY, Govt, Commercial & Private; Satellite & Terrestrial Microwave 2-WAY & Telephone Relay; US TV Channels 14-83, Police Radar, Aviation, Weather & Ship Radar; Amateur UHF Bands, Microwave Ovens
3 GHz to 300 GHz	Super High Frequency (SHF)	Same As Above, Plus Backyard Satellite TV "Dishes," Space Communications, Radio Astronomy

STATE OF EMERGENCY

Continued from page 43

tain that the military will take complete control in an emergency. Bayonets will condition our responses, and the harsh discipline of military organization will regulate our work and welfare."

Other governments also have prepared to suspend the rights of their citizenry if conditions warrant it. In a British Home Office circular prepared secretly for government officials, words which seem quite similar to those in U.S. planning documents are found. For example, "in the absence of effective sanctions, short of summary execution for dealing with those who might not comply with directions, success (in the recovery effort) . . . would depend on the communities' acceptance of the need." Also found in the same circular is a thinly disguised justification for using the harshest methods to insure cooperation of the citizenry. "In conditions in which death, destruction, and injury were commonplace such penalties as probation, fines, or imprisonment would no longer be effective. Such penalties as communal labor, restricted rations, and exposure to public disapproval might be appropriate for all but the gravest offenses, but in the case of flagrantly anti-social behavior there might be a need for harsher penalties than would generally be acceptable . . . Regional Commissioners, would be empowered to impose such penalties as they thought fit in light of conditions at the time."

Since the British history and temperament is far less based on the individualism which is almost inborn with Americans, it can be assumed that since the British feel the need for such radical controls of their population, American authorities are probably even more apt to feel the need for similar controls.

Another Possibility—Earlier in this article the history and probability of the introduction of martial law during a crisis was examined. Martial law, no matter how harsh its administration, might be preferable to some of the other possibilities which U.S. crises planners have studied and which impact upon survivors directly.

The imposition of martial law depends upon a functioning command structure, and as well, requires the manpower to enforce its edicts. There is a distinct possibility that neither of these conditions will exist in the post-attack U.S. The reasons for this are, first, that a substantial percentage of U.S. military forces may be fighting overseas, and secondly, those military units within the U.S. will be located on military bases which themselves are prime Soviet targets. According to the National Governors Conference Emergency Preparedness Project, "these military forces could be subjected to a greater casualty rate than civilians would be.

Should this be the case, civilians might need to provide assistance to the surviving military forces—the reverse of the peacetime roles." Far from having an organized military, which could impose order through martial law, we might see individuals or fragmented units of the military take on a very different role. From the National Governors Conference report comes the following, "Finally—in a grim aspect—dispersed military personnel, trying to reform as units, postattack, might aggressively compete with local communities for survival supplies. If a community considered them to be marauders or external "parasitic" groups, it would probably resist their demands, possibly causing intense local conflicts."

Conclusion—The very nature of survivalism requires those who practice it to become knowledgeable about events and possibilities which are of a decidedly unpleasant nature. To have a chance of surviving any disaster, be it nuclear war or something less severe in its consequences, an individual must learn the effects of that occurrence in order to take effective steps

to live through it.

Many survivalists have on hand the equipment, medical supplies, food, and books which will help them to, at least physically, survive a major disaster. Very few survivalists however have given much thought about what happens after the disaster. This is to some extent understandable. It is far easier to gather the equipment which will allow physical survival, than it is to mentally prepare oneself for the conditions which will prevail post-disaster.

The intent of this article was to provoke thought among those who intend to survive, about the conditions in which they may well find themselves living after a major catastrophe. This author advocates neither total submission nor open conflict with the authorities who will take charge of recovery efforts. Such decisions, quite literally, are life and death decisions, and must be made by the individual or the group for themselves. As with any crucial decision, the more facts in possession of the decision-maker, the more likely he is to make the "correct" decision for himself, his family or group, and his country. ●

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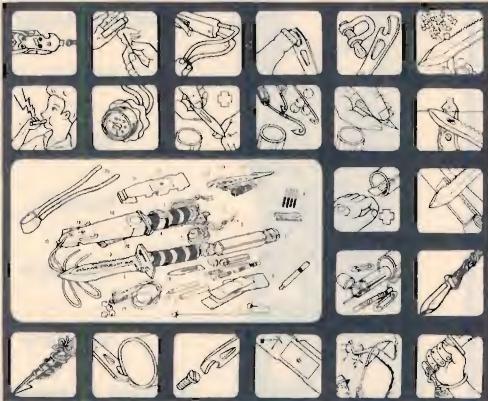
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SELF SUFFICIENCY RADIO

Continued from page 58

one of the 800-plus channels available on this portable, to talk to another station directly—not using a repeater—on a "simplex" frequency (on which repeaters are not allowed), where it is much less likely that anyone else is listening within range.

Antennas—Although privacy is never guaranteed when using radio, unless you use sophisticated scrambling techniques, you can almost assure a private conversation by using an out of the way frequency, just enough transmit power to reach the other station, and directional antennas.

The use of directional antennas deserves some elaboration, as survival and emergency communications operations can benefit greatly by their use, especially at VHF and UHF ranges. To understand what a directional antenna does to a signal, we need to use an illustration which readers of my previous article on Amateur Radio (August, 1985 ASG) will recognize: the light bulb analogy. Light and radio waves have enough in common to make this a fair representation of the facts.

Visualize a cubicle in which the only source of light is a bare bulb, hanging from a wire in the exact center of the room. We want to look at a small area of one wall of the room, and the rest of the walls and floors are of no importance. Right now, the light is more or less evenly distributed over all four walls, the ceiling, and the floor.

To get a better look at the target, we place a reflector on the side of the bulb opposite the target. The light that before fell on the opposite wall now shines on the wall that holds the target, and we can see it a little better. We put another, larger reflector behind the bulb, and the light that was hitting the ceiling and floor now shines on the target wall.

Now, we place a lens in front of the bulb. The lens concentrates the light passing through it in the target. All the previously wasted light now is reflected and focused on the target, and the rest of the room is in darkness. An observer watching from the target would have seen the light shining on him getting progressively brighter, while the rest of the room got darker. If the light had been a radio signal, the receiver at the target would have heard a stronger and stronger signal.

But remember, the bulb never actually got brighter, consuming more electricity. Had these been radio waves instead of light waves, the distant transmitter would not have to increase its power (and energy consumption) in order to deliver a stronger signal. And a directional antenna is cheaper, and easier to make and carry, than a powerful transmitter and the power source it requires.

Connecting my portable to a directional antenna mounted on the roof makes the two-watt signal from the portable seem

more like 20 watts to a station in the direction it is "looking," and the wire antennas spread out on my property give my 100-watt HF "rig" a 1,000- to 2,000-watt effective signal. Both antennas cost a very small fraction of the price of the equipment needed to put out a signal which would actually be that strong. There are situations in which a directional antenna is not appropriate. For example, a scanner intended to listen to signals from any direction requires an omnidirectional antenna. Another special quality that needs to be considered for any antenna is frequency coverage, or "bandwidth." A scanner needs to cover a tremendous range of frequencies, and any simple antenna by nature will cover only a limited range. Signals outside that range will appear to be weaker than they actually are, because the antenna is less efficient outside its bandwidth.

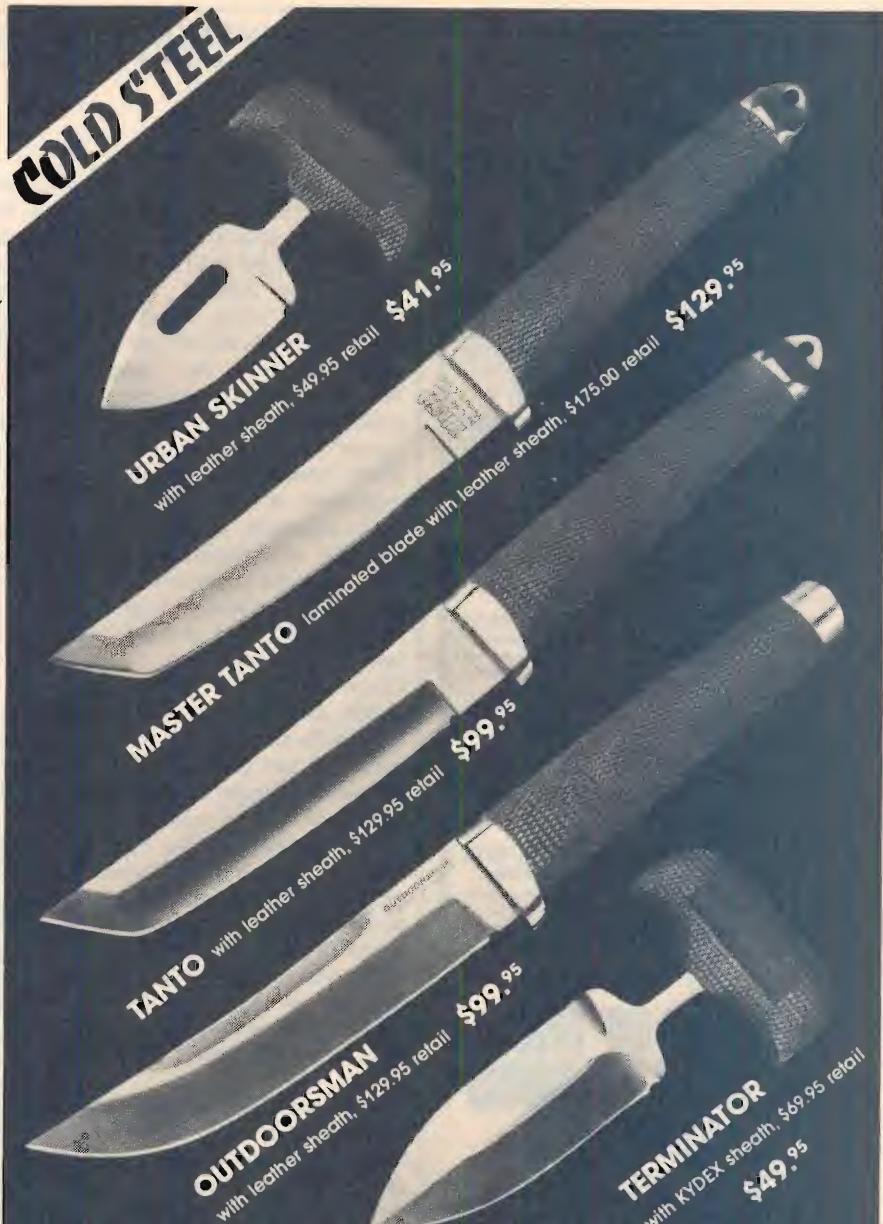
Two solutions exist for the bandwidth problem. For the scanner, there are antenna designs that, although complicated, have much greater bandwidth than those commonly recommended for scanners. For HF equipment, there is a device called an antenna tuner, which can change the characteristics of the antenna circuit to match a wide variety of antennas to a broad range of frequencies.

Large bandwidth antennas are also available for HF, but they tend to be large and very expensive, so the antenna tuner is the best compromise at these frequencies. An HF band antenna tuner by MFJ is a very small package, weighs less than two pounds, and cost about \$90 new. Used units are available at hamfests for half the new price or less. One antenna for scanner use that answers the need for sensitivity in all directions and for coverage of a large frequency range is the "discone." The discone looks peculiar, but it is not difficult to build, and commercial models are available at moderate cost. Plans for the discone can be found in the *ARRL Handbook*, one of the primary sources of useful information of all sorts about Amateur Radio.

ASG readers should be aware that Amateur Radio doesn't hold a monopoly on access to VHF and UHF frequencies. Most Americans above the age of 18 can apply to the FCC for the privilege of operating their own VHF or UHF radio system.

GMRS—The General Mobile Radio-telephone Service is the structure established by the FCC to meet the needs of the average citizen for short-range radio communication to aid in his personal or small business activities. Radio equipment authorized by the FCC for use in this service is very similar to the other types of commercial "land mobile" equipment discussed

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FRESHWATER FORAGING

Continued from page 53

harvestable fish. Along a wooded shoreline, if available cover (rocks, stumps, etc.) is scarce or absent, cutting a few trees and letting them fall into the water will create habitat for crappie, bass, pike, etc. Further off shore, trees (brushy trees / small fir trees) can be sunk with the aid of concrete blocks, etc.—again creating a fish haven. Rocks, concrete blocks, and other “clean” rubble also have possibilities as reef material. In essence, by creating a more favorable/hospitable locale, small organisms at the beginning of the food chain take hold, in turn this attracts small bait fish and immature food/game fish, with the large predatory fish coming last. The shore habitat improvements are readily visible. The one positioned offshore (submerged ones) can be relocated by Loran-C “fixes” or by “taking ranges” or visible shore features. In secure locales or areas without excessive competition, buoys anchored can give notice. Rod and reel, gill netting, traps can all be fished near such man created structure.

For extreme needs for mobility as well as a lack of storage space, “telescoping rods” are a survivalist angler’s dream. When extended, these rods roughly equal the length of “standard issue” fly, bait, or spin rods with the added advantage of being reduced to 1½- to 2½-feet lengths. Material of construction includes aluminum, steel, fiber glass and plastic.

Firearms—Fish can be shot with firearms but it is not recommended as water and surrounding bottom tend to ricochet the projectile(s). Years ago, while hunting ruffed grouse in a hilly section of New England, my only access further into the “highlands” (due to excessive vegetation) was to wade a shallow trout brook. Doing so, I spooked a beautiful native trout, which passing through the pool connecting riffles “fell” to a charge of #7½ shot fired next to it, the concussion sufficiently killing the trout. Later on, I realized the fatal possibilities of the shot “coming back” and striking me. The bottom was composed of hard gravel laced with several large boulders. Shotgun pellets are round and tend to penetrate without deflection. If I had used a rifle (or any firearm with one solid projectile), it could have been me, not the trout bagged. While I was living in Utah, a ranch hand told me a hunter out for mule deer spotted a nice sized trout in a shallow creek. He took aim and let loose with a high powered rifle. The bullet bounced back and knocked his left eye out. Whether or not this story is nothing more than a campfire yarn, it makes a point—don’t shoot at fish!

Warm water discharges originating from power/industrial plants (cooling systems)

into impoundments, lakes, ponds and streams usually provide a favorable habitat for food/game fish during fall, winter and spring months in temperate regions (bulk of North American Continent). A temperature gradient spanning hot-warm-luke warm-cool extends outward up to 1 mile in lakes, and anywhere from several hundred yards to miles downstream on moving waters. The factors in control include initial discharge temperature, volume (rate) of discharge, shape of accepting basin (i.e., shallow, deep, etc.), whether a still or moving water situation. Predatory game/food fish respond to the bait fish and other edibles (crayfish, etc.) that are attracted to the warm waters. Look for trout, bass, pike, perch, walleye, etc. (all at varying distances from discharge). All seeking their preferred water/feeding temperature.

In addition, fish will be located along the edges of the thermal plume. Just imagine a “warm water” fish, say a largemouth bass of 4 to 5 pounds smashing a top water plug during a January snowstorm. Good eat’n’ round the evening fire! fire!

In many instances, try to fish prior to the arrival of the so-called “cold front”—a meteorological term. Changing air pressure affects fish feeding schedules. Fishing is likely to be extra good at the approach of a storm, at a time where the barometric pressure, preceding the cold front is low. When cooler air is noticed, that implies the front has passed on. Usually the feeding activity of the fish will come to a halt and the fish will be found deeper if the basin configuration allows. In many instances, fish that have been located at a particular locale, will remain there for a fair period of time if bait and weather conditions have remained fairly constant (stable).

In the aftermath of moderate/severe atmospheric upheavals (storms), fish tend to scatter for several days, until wave/sediments settle down, then they regroup, often at new locales. The angler must then relocate them, thus setting up the “pattern” again.

The most favorable winds for angling are from the south, southwest, or west. However, during a hot spell when the wind shifts from the south to the northwest, bringing in cooler weather, it often causes the fish of “summer slumps” to begin feeding. East and northeast winds are generally poor for fishing but their are exceptions to the rule.

The old adage “gotta have the line in the water to catch fish” holds true. A few years back, I remembered the boats on a particular piece of water bunched up at mid morning, all without fish, the fishermen blaming the weather, etc., for their

combined failure. While the anglers chattered about their dismay, I lowered over the side of a partner's boat a live bait fish and within minutes hauled up a 25-pound striped bass. *The line must be in the water to catch 'em!* When is the best time to fish, survival or otherwise? Whenever possible.

Rainfall—Precipitation in the form of rain can effect stream fishing conditions. A crystal clear river populated by easily spooked clear water residents (bass, trout), is afflicted by these late season low water conditions. The fish are just about captureless unless nets and explosives are in order. To capture on rod and reel, a *moderate* rainstorm affecting the upstream portion will induce lower stream temperatures, increased flow and resulting turbidity, all adding to more conducive hook and line fishery. The fish will be on a more "active" feed and less alarmed by angler presence. Note: too little rainfall will have minimal impact. Excessive rainfall with its associated flooding will negate its usefulness (then only fish in the first noticeable water level "rise"). Use caution in angling streams possessing flash flood potential, such as in mountain and desert areas.

Snowfall in mountainous areas adjacent and upstream on the watershed can severely restrict fishable times in many flowing waters. Melts of mountain snows continue well into June (Sierras, Cascades, Rockies, etc.). The results are that many streams remain unfishable to late June-early July green water (melt water) torrents. Once receded in flow, these streams are quite productive for the remainder of the summer months, well into the fall and sometimes into early winter.

While ice fishing, live bait fish in buckets can be aerated and acclimated to fishing water (i.e., lake, pond, etc.) they are about to enter by the addition of chunks of ice (chips from the hole just cut). The cold water shock might otherwise kill them.

While stream fishing (wading or shore) or navigating streams, lakes and ponds via watercraft (i.e., canoes, rubber inflatables, etc.), the use of polarizing sunglasses and visor hat (baseball cap) will aid in the locating of subsurface fish holding structure and fish themselves, as well as exposing any underwater hazards to navigation. To achieve this advantage, waters must be mostly clear in nature. In addition, the hat/sunglasses combo reduces eye strain and resulting fatigue. Furthermore, these eye protectors aid in the prevention of "night blindness," the inability of eyes exposed to direct/reflected light (sunlight) to adjust ("see") during low light levels (nighttime).

Continued on page 64

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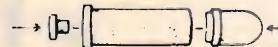
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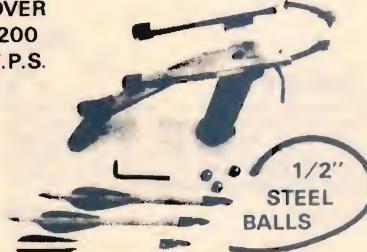
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oil "holding and dispensing" Magnum Juice Balls fishing baits—in #2/0 and 1 hook sizes. After soaking them in the bait oils, drift them down into salmon and steelhead holding areas.

Basic live fish storage for short intervals may be provided by a rope or chain stringer applied through the lips of a variety of species and then tied close enough to the water for the "detained" fish to submerge. Makeshift stringers can be readily fabricated from whippy forked branches. Remove all side stems, except for forked end. Slide fish on through lips (if possible to prevent gill damage) or through gills out the mouth. Jab pointed end into bank just under water surface.

Crappie (white and black) respond during warmer months to light held above the water at night (from boat, dock, etc. E.g., a Coleman Gas Lantern. Lights that float on the surface and aim beams downward are expressly made for this use). In essence, the light attracts small terrestrial and aquatic insects, which in turn attract minnows, which have a crappie following. On many lakes and impoundments, largemouth, smallmouth, white, yellow, striped bass will often join the feeding melee. Lower a hooked live minnow below the light. Small jigs also work. Fish them vertically.

Pork rinds are artificial lures manufactured from pig skin and fat that are cut into fish catching shapes, and are preserved in salt brines. The natural flesh writhes and wiggles in enticing moves and has the natural soft feel that offers more time for the unsuspecting fish to munch on. Rinds can be fished alone on hooks (weedless or regular), or in conjunction with jugs and spoons. They offer excellent storage potential with indefinite shelf life in the brine bottle (many times the rinds are reusable. Simply re-bottle them). Recommended rinds include: Uncle Josh Brand #50, 70, Bass Strips (white) and Pork Frogs #1 (green spot), and #90 Fly Flick (white).

An angler should know how to tune a plug to obtain maximum fish catching ability for everyday use, or to tune a new one. For example, with Rebel & Rapala plugs the wire eye might need some adjustment. Bend the eye up, down, left or right until lure runs straight and true (if possible use a needle nose pliers). A properly oscillating plug will enhance one's capture percentages.

When catfishing (trot, set, rod and reel) in very turbid waters, use a 1- to 2½-inch cube of sponge as a fish bait-attractor. Simply soak the sponge in bait oils, renderings of waste fish, etc. The sponge will

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NEW MADRID

Continued from page 24

miles. Interstate natural gas and petroleum product pipelines would rupture. Sewage systems would break, thus causing disease hazards. Major lifelines such as telecommunications, highways, bridges, electric power networks, airports and inland waterways would become unusable. Computer systems would malfunction. Secondary costs of damage, as in fires and interruption of services would often exceed the loss of the facility itself. In sum, the earthquake's effects would soon disrupt the entire U.S. economy and society.

Another potential problem involves nuclear power facilities. No nuclear power plants have been built in the immediate New Madrid zone because in safety measures, required vibration tolerances would be so high that construction costs are prohibitive. Still, existing nuclear plants in outlying areas might be damaged in a major quake. Prof. Arch Johnson, director of the Tennessee Earthquake Information Center, points out that the New Madrid seismic zone extends northeast along the Wabash River fault system into Indiana where a quake might affect nuclear facilities.

Conditioning, Preparedness—Human survival in a major earthquake would depend partly on psychological conditioning and material preparedness. Having experienced numerous catastrophic quakes during the 20th century, the Japanese lead the world in learning how to cope with these disasters and mitigate their effects. In the drive for earthquake safety, California follows Japan, though for political and economic reasons, safety provisions involving the San Andreas Fault have often been shunted aside. Still, quake-prone California has a high public awareness about earthquake hazards. Moreover, the city of Los Angeles has adopted both seismic design provisions for new buildings and retrofit requirements for existing structures.

Because a great quake hasn't rocked the New Madrid zone in many decades, earthquake awareness remains low. Few if any people in today's bucolic town of New Madrid worry about potential hazards. In fact, many people in the New Madrid zone would prefer not to think about them at all and they shrug off the frequently detectable tremors. Sociologists refer to this as the "denial syndrome." Other public attitudes include a sense of fatalism and helplessness; for example, some people feel their individual actions during an earthquake would prove useless.

Much of this seems to confirm the old saying that seismic safety awaits a big earthquake. Politically and economically, major earthquake safety provisions are more easily introduced *after* a disaster during a time of emotional stress and sud-

denly heightened public awareness. In a region like New Madrid with prolonged periods of relative calm before a major quake, public complacency is understandable. But authorities on the New Madrid situation warn that this complacency is one of the greatest dangers of all.

Alerting the public to earthquake hazards is generally a slow and tedious process. This difficult procedure ranks high in the priorities of the five-year plan partly because public attitudes influence legislators and other policy makers. Another difficulty arises here, for politicians' concerns tend toward short-term solutions during their tenures in office. Technical information and capability for earthquake mitigation often outpace the ability to adopt new concepts as public policy.

For its part, the business-industrial community is attracted to earthquake safety primarily if the measures are cost effective. For example, the New Madrid zone should have earthquake resistant design features in building codes for structural, mechanical, electrical and distribution systems. This is particularly important for facilities essential to public welfare during an emergency. But excessive costs would dim chances for adoption particularly among economy-minded businessmen. Thus the five-year plan emphasizes earthquake mitigation measures with the highest payoff coupled with the lowest cost and effort.

One aspect of maintaining public awareness concerns earthquake lore. Doomsday predictions may alienate pragmatists and produce negative effects but they do keep earthquake hazards before the public eye. For instance, since biblical times, people have regarded earthquakes as God's punishment for a sinful humanity. Typifying this were the many jeremiads by frontier preachers in the New Madrid area during the early 19th century. According to one, the great quakes of 1811-1812 "was a time of great terror to sinners." Since the town of New Madrid was notorious for its rowdy Mississippi boatmen who squandered their sabbaths in drinking, gambling and fighting, some religious-minded people felt the town got its just desserts.

But the key question is, will anyone in the Mississippi Valley be prepared for the next big quake? FEMA and associated agencies have made earthquake response planning one of their two largest such efforts in the U.S.; the other major project is for California. But predictability remains essential for complete preparedness and here lies a big problem. Earthquakes are simply unpredictable to any reliable degree. A rule of thumb is that any region with an earthquake history should expect one in the future but this says very little.

Controversial predicting methods have been used in various parts of the world. Scientific researchers make extrapolations from magnitude and recurrence curves, but this seems faulty because earthquakes don't recur in exact cyclical patterns. Frequent readings of subterranean water levels offers another technique. The levels tend to rise before an earthquake and then fall back to normal just before the tremors. Another precursor of quakes is abnormal animal behavior, as in the New Madrid quakes of 1811-1812. Observers in the People's Republic of China often point to abnormal animal behavior as an element in predictability. Japan has some of the world's most elaborate prediction systems including water level monitoring, checking of earth deformations and other precursor measurements, but most of these methods are unproven and unreliable.

Probability, Risk—The New Madrid situation remains one of low probability together with very high risk. Arch Johnson indicates that pressure accumulation in the New Madrid zone causes a 6.2 magnitude quake on an average of every 70 years plus or minus 15. A magnitude 8 quake could happen every 600 to 1,800 years. But he emphasizes that a great quake could rock the area any time and that it is inevitable. Referring to the great cataclysms of 1811-1812, Prof. Nuttli is similarly cautious in his forecast: "It might be one year, it might be 100 years—but eventually it will happen again." •



A woodcut of the New Madrid quakes depicts inhabitants fleeing their tumbling log cabins as fissures rend the earth and lightning flashes in dark skies (Source: Henry Howe, *The Great West* (1851) in the State Historical Society of Missouri).

FRESHWATER

Continued from page 65

leach out fish attracting odor for some time. Change bait sponge every 30 minutes to insure maximum fish attracting scent.

Tailwaters or outflow from large impoundments, dams usually produce good, year round fishing locales. The dam itself blocks any further upstream movement of fish (thus concentrating them) and provides a site for feeding augmented by the small and large chopped up (by generator turbines) fish passing through the facilities (a kind of "chum line").

Fish available vary with species present with striped bass, salmon, walleye partial to these tailwaters. Certain shoal areas adjacent to dam structures also provide concentrated spawning locales. Exercise caution when fishing below dams, either wading, bank, or both. Many times the water release schedules are known. Others use horns sounding/lights flashing prior to the deluge. It is also worth noting that discharges might affect relative position (in stream) of the fish. Scout around and find the patterns (locales) the fish frequent at different flow periods.

Snapping and alligator snapping turtles can be readily caught by these two makeshift methos: 1) a good size floating log (i.e., 1 foot wide by 10 feet long) rimmed with stout treble hooks (i.e., 2/0 to 5/0 #35517 Mustad) fastened by heavy duty wood screws at the perimeter waterline and spaced every 6 to 8 inches with bait consisting of fish, fowl, etc., nailed to centerline (above the water level primarily). Fasten a chunk below the water line to aid in attracting the water habitated turtle. When the turtle climbs onto the log in search of additional food it will get "hung up" with its feet on the hooks. Anchor the log in known turtle territory, usually a sluggish river, backwaters, flooded marsh, ponds, etc. Method 2) consists of a 50 to 55 gallon metal barrel equipped with metal rods ($\frac{1}{4}$ to $\frac{1}{2}$ inch in diameter) inserted through the center of the barrel, all in parallel, leaving 6- to 8-inch spaces. Bait and ballast (rocks) are fastened to the bottom of the barrel and the device is sunk in turtle territory, leaving 1 to 3 feet of water over the uncovered barrel top. The turtle swims downward for the bait, passes through the parallel bars and eats. When it's time to exit the bars prevent it. The snapper tries to climb along the outer contours of the barrel, thus hitting the bars at the wrong angle and is captured.

The freshwater forager should also include spare reels parts, service manuals, rod guides, spools, and tools to insure operation of basic rod and reel fish capture gear. •



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WATER FILTERS

Continued from page 45

drops at a time would be ideal); don't let the water flow between the filter paper and the edge of the funnel; remember to change the carbon every three weeks to keep bacteria growth down; and/or change the carbon after 20 gallons of water have been filtered by it (for a large funnel —smaller funnels would need to be changed more often).

Of course this filter is not too handy to use. It's easy to spill the carbon out and the amount of water it can handle is small.

A better filter that can get around these problems can be created by using a set-up that can be regulated so only small volumes of water go through the unit (so that it can be used on a round-the-clock basis).

When using a larger filter, it's a good idea to disinfect the inside of the tubing when the carbon is changed (which should be done at least every three weeks). Use straight bleach (sodium hypochlorite) for this and then let it stand and dry afterward.

A larger filter like that shown in Figure 2 could be created with $\frac{1}{4}$ -inch tubing, $\frac{1}{4}$ -inch tubing elbows and a tee, a reducing union ($\frac{1}{4}$ - to 2-inch), and a length of 2-inch pipe. While the most durable filter could be created with copper tubing and galvanized pipe, the easiest to build is constructed with plastic pipe. Plastic pipe can easily be cut with a hand saw and screwed or glued together. For most filter builders, plastic pipe is the route to take.

Of course, neither copper nor plastic pipe is essential. In a time of crisis, anything from rubber hose to the "innerds" from the scrounged cooling system of an old refrigerator could be used to create a filter provided the dimensions were roughly equivalent.

Cotton plugs are used in the bottom of the filter (about 2 inches deep) to keep the carbon from getting into the water supply; other fabrics and fibers could be substituted. Twenty-eight incies of activated carbon is most ideal for this filter though a shorter column could be used. For ideal performance, water should be allowed to accumulate above the carbon to a depth of 3 or 4 inches. This is accomplished by adjusting the height of the outlet tubing so that the upper tee is level with the point where the top of the water should be in the filter.

Daily flow rate should be a maximum of six gallons per day. Ideally, the charcoal should be replaced every three weeks to keep growth of bacteria in it to safe levels or replaced after 120 gallons of water have been filtered by it.

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EARTHQUAKE

Continued on page 30



San Francisco was destroyed by a great earthquake estimated to have had a magnitude of about 8.3 on the Richter Scale that hit on April 18, 1906. Structures not destroyed by the powerful quake shocks were burned in a massive fire that followed.

the entire plate slides.

The plates tend to be internally rigid and interact mostly at their edges. Plates slide past one another along strike-slip faults, which can be either on land or at sea. The best known of these faults is the San Andreas Fault of California, now being studied intensively by geoscientists of the U.S. Geological Survey and other institutions.

Large parts of some of the continents depart from ideal rigid-plate behavior and undergo much internal deformation. The western continental U.S. is now being broadly stretched and sheared. The San Andreas Fault marks the boundary between the Pacific Plate on the west and the North American Plate on the east. Although most of the relatively northwestward motion of the Pacific Plate past the North American Plate is taken up along the San Andreas Fault, a part is distributed far inland, and the continental crust is stretched and shattered into the many block ranges and basins and other structures. Scientists say that tens of millions of years from now, coastal California, including what is now Los Angeles and San Francisco, will be an island due to the northwest motion of the Pacific Plate relative to the North American Plate at the San Andreas Fault.

Predicting Earthquakes—Current ability to predict the time, place and size of earthquakes is very limited. However, considerable progress has been made in formulating the statistical probability that an earthquake of a certain magnitude will occur within a specific period of time.

Twenty years ago the National Center for Earthquake Research at the U.S.

Geological Survey's Western Region facilities in Menlo Park, California, began a program to study the causes of earthquakes, their influence on humans and property, and techniques for predicting occurrence of earthquakes.

The greatest emphasis in the National Center's investigations of earthquake-prone areas is fault zones in California and Nevada, especially the San Andreas Fault. The faults are being mapped and identified by type and movements. Quake shocks along the faults are continuously recorded. Fault zones in other western states and in Hawaii and Alaska are also being studied. Scientists are hopeful that this research will reveal patterns assisting in earthquake prediction. Scientists in the Soviet Union, the Peoples Republic of China and other countries have mounted major studies of earthquakes.

A 15-mile-long stretch of the San Andreas Fault, located roughly at its midpoint in central California near the small town of Parkfield, has become perhaps the best understood earthquake source region in the world. Scientists are exhaustively monitoring this section of the fault.

Moderate-sized earthquakes have occurred at Parkfield in 1881, 1901, 1922, 1934 and 1966. The only exception to an approximate 21- to 22-year recurrence time is the 1934 shock. The 44 years between 1922 and 1966 is just twice the usual time between the shocks. The 1966 earthquake reestablished the regular timing pattern of the Parkfield earthquakes. If the next Parkfield earthquake conforms to the pattern, it will occur in the next few years, most likely in 1987 or 1988.

Continued on page 74

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SWISS ARMY KNIVES

Continued from page 29

is provided in this article with considerations in their selection. Basically, the minimum tools you should have are: one or two blades, a standard screwdriver, a Phillips screwdriver, a can opener and an awl/reamer. These are the tools I find I use regularly in everyday activities.

Beyond that, you're limited only by how much bulk and weight you're willing to carry. If you want to carry the knife in your pocket, don't exceed a thickness of three blades—any larger makes an uncomfortable bulge. If it's convenient to carry a belt pouch, you can go all the way to the largest models. Belt pouches aren't included with Swiss Army knives, so count on paying extra.

If you're willing to carry your knife in a sheath, keep this in mind: each blade adds only a fraction of an ounce to the whole knife. The largest Swiss Army knife

weighs less than 6 ounces. So if there's any possibility you might use a tool, you may as well get it. I worked my way up from the little Victorinox Tinker to progressively larger and more elaborate models until I bought the Champion. I've used every tool on it at some time or another. I still use both—the Tinker when I can't wear a belt knife and the Champion when I can.

The last consideration is price and availability of models. Here you simply have to shop around. Generally, the best bargains can be found through catalogs, but they often don't carry complete selections. Knife shops will have slightly higher prices, but will carry models that aren't available through catalogs.

Prices run from around \$12 for the small, 4 to 6 blade pocket models to \$36 to \$48 for the largest belt models. Belt pouches run from \$5 to \$10. The Leather-

man Tool costs from \$40 to \$55.

Victorinox is by far the easiest Swiss Army knife to find. They are carried by most knife shops and outdoor stores. Wenger is increasing its distribution, but is still difficult to locate in some areas. Some national stores that carry them are: Oshman's Sporting Goods, Ace Hardware, K-Mart and Sears. They're also available through the L.L. Bean catalog (Freeport, ME 04033).

The Leatherman Tool is becoming increasingly available at major knife shops. They're also available at Oshman's Sporting Goods and through catalogs from L.L. Bean and Eddie Bauer (P.O. Box 3700; Seattle, WA 98124).

There's no doubt that a hunting knife has a place among the survivalist's tools, but a pocket tool kit is best for getting you to the places where you can use it. •

ACCESSORIES LIST

HE'RES WHAT you can get in various combinations in your pocket tool kit. Abbreviations (in parentheses) indicate which brands have that accessory available.

KNIFE BLADES (all). Most models have a small and large blade. Having two blades can allow one to be honed to a strong edge for ripping and heavy cutting while reserving the other for a surgically sharp edge. Locking blades are only available on Wenger and Leatherman.

CORKSCREWS (V & W). This item looks a little out of place in the U.S., but they're a common item on Swiss Army knives. This is because wine is still the most popular beverage in Europe, where easy-open caps still haven't caught on.

CAN OPENER (all). Indispensable when camping or otherwise roughing it. The Victorinox can opener is a unique, forward-cutting design that incorporates a small screwdriver in the tip.

BOTTLE OPENER (all). Another item more useful abroad than in the U.S., but on most models, it's combined with a large blade, standard screwdriver at the tip.

STANDARD SCREWDRIVERS (all). As mentioned above, these are usually incorporated into the bottle opener. The Leatherman Tool has three separate screwdrivers ranging from very large to small enough for eyeglass screws. Victorinox also has an eyeglass screwdriver—a separate item that cleverly stores inside the corkscrew. Wenger screwdrivers lock when pressure is put on them, preventing them from slipping and snapping shut on your fingers.

WIRE STRIPPER (V & W). A small notch in the bottle opener blade through which wire can be hooked to

pull off the insulation.

WIRE CUTTER (L only). Practical, plier-type cutters are available only on the Leatherman Tool. With a Swiss Army knife, wire can be awkwardly but adequately cut with the metal saw.

PHILLIPS SCREWDRIVER (all). Available on all tools in various forms. Phillips screwdrivers are mounted in two different manners. They can be mounted on the end like a normal blade or on the back to form a T-handle screwdriver. Either one will do the job, but an end-mounted screwdriver is usually easier to use and more versatile.

MAGNIFYING GLASS (V & W). These are handy when working on small equipment or electronic parts and also for locating and removing tiny splinters. Both makers use glass. Victorinox is mounted in plastic, while Wenger uses a stainless steel mount that incorporates a small screwdriver at the tip. Don't let anyone tell you they can be used to start fires in an emergency—neither glass collects sufficient sunlight to reach burning temperature.

AWL/REAMER (all). A leather punch with a wide-angle edge to use for scraping or inscribing metal.

WOOD SAW (V & W). Can be used to cut wood up to 2½ inches in diameter. Some people say they aren't very useful. I've mostly used mine in the garden, but one skeptic was converted when he saw one used to cut poles for a stretcher in the wilderness. A knife would work, but it's slower and sloppier.

FISH SCALER AND HOOK DISGORGER (V & W). Handy for fishermen, but if you use it, be sure to have a lanyard attached in case it slips out of your hand. The Victorinox version

is magnetized to pick up small metal parts dropped into inaccessible areas and is also ruled in inches and centimeters.

METAL FILE/SAW (all). All files will also work as hacksaws. The Victorinox model has fine and coarse surfaces with a nail cleaner at the end. Wenger has a separate nail file and cleaner, so the metal file/saw is strictly for metal. The file on the Leatherman Tool is also strictly for metal.

TWEEZERS (V & W). Useful for traditional splinter-pulling as well as manipulating parts too small for clumsy fingertips. Wenger models have the fingernail catches for both the tweezers and toothpick facing the inside of the knife. This makes it virtually impossible to accidentally lose them. Victorinox catches are on the outside, which increases probability of loss.

TOOTHPICK (V & W). Next best thing to a toothbrush.

WRENCH (W only). Wenger incorporated a unique blade that functions as a universal wrench. You can't disassemble engines with it, of course, but it can remove nuts up to 5/16 of an inch.

SCISSORS (V & W). These are more useful than they appear. They're more effective than a blade at cutting anything from bandages to broken fingernails. Both brands are spring loaded, but Wenger uses a design that works off the knife spring. Victorinox uses a separate spring that can break or fall out, but replacements are fairly easy to obtain.

PLIERS (L only). Leatherman has a monopoly on this one. It is the most effective tool for removing nuts and bolts and can also be used as a fishhook disgorging.

EARTHQUAKE

Continued from page 69

Besides the predictable 22 years between shocks, Parkfield earthquakes share remarkably similar or characteristic features: magnitude, length, location of rupture and epicenter.

The Parkfield experiment is providing important experience in the design and operation of strain-monitoring instruments that ultimately may be adapted for use in a prototype earthquake-prediction network. The Parkfield earthquake study may provide data fundamental to the successful design of earthquake prediction strategies for southern California and other earthquake-prone areas of the country.

WHAT TO DO

AT PRESENT, there is insufficient information available to scientists for the effective and accurate prediction of the location and size of earthquakes.

The best protection from earthquakes appears to be avoiding construction in high-risk areas and use of earthquake-resistant construction techniques and materials. In areas already inhabited which are at high risk for earthquakes, the emphasis should be on improved construction methods and zoning of damage-prone undeveloped land for nonresidential use.

The actual movement of ground in an earthquake is seldom the direct cause of death or injury. Most casualties result from falling objects and debris from buildings shaken and damaged by quakes. Quakes can also trigger landslides and generate seismic sea waves in some areas which can cause great damage.

Collapsing buildings or parts of buildings, flying glass from broken windows, overturned bookcases, furniture and appliances, fires from broken chimneys, broken gas lines, fallen power lines and drastic human actions resulting from panic commonly caused injuries and deaths in earthquakes.

There is no way to reduce all earthquake dangers, but there are many actions you can take to help reduce the risks.

Before An Earthquake—Support local programs for correcting hazardous unreinforced masonry buildings.

Support school building programs which provide for the strengthening of old, weak school buildings or their replacement with earthquake-resistant structures on ground reasonably safe from failure during a strong earthquake.

Support community efforts to replace old weak buildings and to insure that loose objects on building exteriors (cornices, etc.) are either removed or securely fastened.

Organize and support programs to prepare for future earthquakes. Schools and civic organizations could provide a very beneficial community service by holding earthquake drills and training sessions to prepare citizens to react properly when earthquakes occur.

Support research programs to identify hazardous areas (active faults, potential landslides, etc.) and to supply information needed to plan wisely the siting, design and construction of man-made structures.

Check your home for earthquake hazards. Bolt down or otherwise provide strong support for water heaters and other gas appliances to prevent lurching or toppling. Fires and explosions

can result from broken gas lines and appliance connections. Use flexible gas connections wherever possible. Place large and heavy objects on the lower shelves. Securely fasten shelves to walls. Brace or anchor high or top-heavy objects.

In new construction or alterations, follow building codes to minimize earthquake hazards. Sites for construction should be selected and engineered to reduce the hazard of damage from an earthquake. Ask your realtor about any hazards near your future home.

Move beds away from glass, bookshelves and other heavy overhanging objects. Remove heavy objects from shelves.

Store caustic, flammable or poisonous materials in unbreakable containers and in protected areas. Hook latches on cupboard doors will keep them closed when bumped from within.

Hold occasional home earthquake drills to provide your family with the knowledge to avoid injury and panic during an earthquake.

Learn and teach members of your family how to turn off electricity, gas and water at main switch valves. Keep tools for such turnoffs in a readily available location, such as near the main gas valve. Do not turn off gas unless you actually smell a gas leak. Check with your local utilities office for instructions, or to have gas turned on.

Have family members receive basic first aid instruction, as medical facilities and personnel may be overloaded in an earthquake.

Keep a flashlight and a battery-powered transistor radio in the home, ready for use at all times.

Keep immunizations up to date for all family members.

Conduct calm family discussions about earthquakes and other possible disasters. Do not tell frightening stories about disasters.

Keep an emergency supply of fresh food, water and medical supplies. Water should be stored in a low place and in unbreakable containers.

Determine if you are in a possible inundation area in case of a dam failure. If so, be especially alert for news of damage following a quake, and discuss with family members what they should do and where you would meet if the neighborhood is evacuated.

Think about what you should do if an earthquake strikes when you are at home; driving your car; at work; in a store, a public hall, a theater or a stadium; visiting friends; or involved in any of your other regular activities. Your planning may enable you to act calmly and constructively in an emergency.

During An Earthquake—Remain calm. Think through the consequences of any action you take. Try to calm and reassure others.

If indoors, watch for falling plaster, bricks, light fixtures, and other objects. Watch out for high bookcases, china cabinets, shelves and other furniture which might slide or topple. Stay away from windows, mirrors and chimneys. If in danger, get under a desk, table or bed; in a corner away from windows; or in a strong doorway. Encourage others to follow your example. Usually it's best not to run outside.

If in a high-rise office or apartment building, get under similar cover. Do not dash for exits, since stairways may be broken and jammed with people. Elevators may stop operating in an earthquake.

If in a crowded store, or place of public assembly, do not rush for a doorway since hundreds may have the same idea. If you must leave the building, choose your exit as carefully

as possible.

If outside, keep away from building walls, block or brick fences, power poles, and other objects which could fall. Do not run through streets. If possible, move to an open area away from all hazards. If in an automobile, stop in the safest place available, preferably an open area away from overpasses.

After An Earthquake—Check for injuries in your family and neighborhood. Do not attempt to move seriously injured persons unless they are in immediate danger of further injury. Check for fires or fire and explosion hazards. Wear shoes in all areas near debris or broken glass.

Check utility lines and appliances for damage. If gas leaks exist, shut off the main gas valve. Do not attempt to turn on the main gas valve. Only the gas company or a qualified plumber or mechanic may do this. If your home's wiring is damaged, shut off electrical power. Report damage to the appropriate utility companies and follow their instructions. Do not use matches, lighters, or open flame appliances until you are sure no gas leaks exist. Do not operate electrical switches or appliances if gas leaks are suspected. This creates sparks which can ignite gas from broken lines.

Do not touch downed power lines or objects touched by the downed wires.

Immediately clean up spilled medicines and other potentially harmful materials.

If water is off, and you do not have an emergency supply, emergency water may be obtained from water heaters, toilet tanks, melted ice cubes and canned vegetables.

Check to see that sewage lines are intact before permitting continued flushing of toilets.

Do not eat or drink anything from open containers near shattered glass. Liquids may be strained through a clean handkerchief or cloth if danger of glass contamination exists.

If power is off, check your freezer and plan meals to use up foods which will spoil quickly.

Use outdoor charcoal broilers or camping stoves for emergency cooking.

Do not use your telephone except for genuine emergency calls. Turn on your radio for damage reports, information, and for emergency services available.

Check your chimney over its entire length for cracks and damage, particularly in the attic and at the roof line. Unnoticed damage could lead to a fire. The initial check should be made from a distance. Approach chimneys with caution.

Check closets and storage shelf areas. Open closet and cupboard doors carefully and watch for falling objects.

Do not spread rumors. They often do great harm following disasters.

Do not go sightseeing immediately, particularly in beach and waterfront areas where seismic sea waves could strike. Keep the street clear for passage of emergency vehicles.

Be prepared for additional earthquake shocks called "aftershocks." Although most of these are smaller than the first shock, it should be anticipated that a second earthquake of equal magnitude could occur shortly afterward. Move vulnerable objects to safer positions. Review other preparation steps.

Respond to requests for help from police, fire fighting, civil defense and relief organizations, but do not go into damaged areas unless your help has been requested. Cooperate fully with public safety officials. In some areas, you may be arrested for getting in the way of disaster relief operations.

Conserve water and food for your and your family's needs. ●

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SELF SUFFICIENCY RADIO

Continued from page 61

earlier. The frequency of operation is specified by the FCC license, as are the transmitter power limitations and the general nature of the transmissions permitted.

Members of a survival group with some capital available for radio gear should examine this alternative. The owners of such a system may discover they can deduct some percentage of the cost of equipment from their income taxes, if they are using the system primarily in the conduct of a small business. GMRS, found in the 460 MHz UHF band, is the "catch-all" radio service that the FCC intended CB to be when it was created in the late 1950s.

It is intended to provide access to non-hobby radio communications for businesses and individuals who might not qualify for a license in one of the specialized business or industrial radio services. Because the UHF signals only rarely propagate over the local horizon, "skip" is not a problem, and the FCC still monitors the use of this service enough to keep abuses to a minimum.

Another significant advantage of GMRS radio is that users of the system do not need operator's licenses, as Radio Amateurs do; there is no test to pass. The FCC licenses only the radio equipment, and specifies, who may operate the equipment, according to their relationship to the person or business named as the licensee.

The process of applying for this type of license is a little more involved than applying for an Amateur Radio license (with the exception that no test is required), and may take some time. Also, FCC regulations limit or prohibit GMRS systems in certain geographic locations. Locations near the Canadian border or in or near large cities are examples. Before you consider a GMRS system, contact the nearest FCC field office and check.

I hope this discussion of frequencies and bands has left you with a feeling of familiarity with the radio spectrum, and an appreciation of what different parts of the spectrum can do for you as you seek communications self-sufficiency. Getting an Amateur Radio license will allow you to explore this new world firsthand, and I strongly urge you to start studying. The rewards are well worth the effort.

For more information on getting your "ticket," ask a friend who is a ham, or get in touch with your local Amateur Radio Club. The Chamber of Commerce may be able to help you locate a nearby club. Or, you can write to the Amateur Radio Relay League, Newington, CT 06111 for information.

Please join me next month for a discussion of the ways in which radio signals can be made to carry information, and how several can be valuable additions to your communications toolbox. ●

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Staff Evaluation

THE .357 MAGNUM revolver was born half a century ago and was an instant success, proving tremendously popular with law enforcement agencies and the shooting public.

Even today, its popularity remains strong and its reputation as a powerful and effective handgun is undiminished.

First developed by Smith & Wesson in conjunction with the Winchester Repeating Arms Company which produced the .357 Magnum cartridge, the .357 Magnum revolver is still the standard issue sidearm worn by many law enforcement personnel.

S&W completed the first .357 Magnum revolver in April 1935 and it was given to FBI Director J. Edgar Hoover. The flood of orders for the weapon that followed overwhelmed the company, as it was intended that the .357 was to have been a custom gun. But except for a halting of production during World War II, S&W has continued manufacturing this model of the .357 Magnum revolver ever since, although with some design changes.

Today the descendant of that first, heavy frame .357 handed to J. Edgar Hoover is the Model 27, which was the model number assigned to it in 1957. The Model 27 is an N-frame revolver—the largest frame S&W uses for the .357. The Model 27 is the oldest N-frame revolver still in production by S&W.

In 1975, S&W improved the prestigious Model 27 by equipping it with a target hammer, target trigger and checkered Goncalo Alves target stocks.

In honor of its 50th birthday, S&W is producing 2,500 special commemorative Model 27 revolvers selling for about \$600 apiece.

The Model 27 is a 6-shot target revolver with a solid frame and swing-out type cylinder. It can be fired either single action or double action. It has target sights. The front sight is a ramp and blade arrangement. The rear sight is the micrometer click type adjustable for windage and elevation. The gun comes in a variety of barrel lengths ranging from 3 1/2 inches to 8 3/8 inches. The Model 27 has an S&W bright blue or a nickel finish and a finely checkered top strap and rib to break up light reflection. Depending on barrel length, the Model 27 weighs 41 to 47 ounces. It fires .357 Magnum or .38 Special ammunition.



Testing—Smith & Wesson loaned this magazine a Model 27 with a 6-inch barrel, as requested, for testing and evaluation. Staff members assigned to evaluate the weapon were excited when the gun arrived and enjoyed discussing its appearance, size and feel. One of the testors has large hands and commented that the gun seemed just right in his hand—not too small or too big. The other testor has small hands but found the Model 27 was nevertheless easy to hold comfortably and firmly with either a one-handed or two-handed grip.

The staff members went to a firing range with the Model 27 and four types of ammunition: Winchester 145-grain .357 Magnum Silvertip hollow points, PMC 125-grain jacketed hollow points, Remington 158-grain .38 Special semi-wadcutter and an identical type of .38 Special ammunition from Miwall Corporation.

The testors were not as familiar with .357 Magnum revolvers as they would like to have been and spent some time getting used to firing the Model 27. As time went on each shooter's groups were tightened

considerably. Each felt his performance would have been much better given more time and ammunition (about 200 rounds were fired). Both testors praised the Model 27, noting that each had made several near dead-center shots at 25 and 50 yards. Best efforts of the day produced a 2 13/16-inch five-shot group at 25 yards with the PMC ammunition and a 6 3/8-inch five-shot group at 50 yards with the Silvertips. Shooting was done from a rest.

Evaluation—The Model 27's large, relatively heavy frame and S&W's excellent design and construction make this weapon one of the most reliable and durable handguns available.

The .357 Magnum cartridge offers substantial advantages over lighter loads and its use with the Model 27 is very desirable for personal defense, particularly home defense. This is truly one of the finest large caliber revolvers on the market and it should be seriously considered by prospective handgun purchasers. ●



The S&W Model 27 comes with several barrel lengths. This one is 6 inches.



The front sight is a ramp and blade arrangement. The rear sight is a micrometer click type adjustable for windage and elevation.

SMITH & WESSON MODEL 27 .357 MAGNUM REVOLVER: TECH SPECS

Caliber357 Magnum/.38 Special
Capacity, rounds	6
Barrel length, inches	3 1/2, 4, 5, 6, 8 3/8
Length, overall, inches	With 6-inch barrel, 11 3/8 With 6-inch barrel, 44
Weight, ounces	
Sights:	
Front	Choice of S&W target types
Rear	S&W micrometer click, adjustable for windage and elevation
Hammer	Wide checked target type
Trigger	S&W grooving and wide target type with internal trigger stop
Frame	Square-butt with grooved tangs
Stocks	Oversized target type of checkered Goncalvo Alves, with S&W monograms
Finish	S&W bright blue or nickel
Price, suggested retail	\$350

Manufacturer Smith & Wesson
2100 Roosevelt Ave.,
P.O. Box 2208
Springfield, MA 01102-2208

Oversize target type checkered Goncalvo Alves stocks, a wide checked target type hammer and wide grooved target trigger are standard on the Model 27.

Many Uses:

G.I. Poncho

One of the important pieces of field gear . . .

By Richard B. McSwain

ONE OF THE most important (and least talked about) pieces of field gear issued to today's combat troops is the poncho with liner.

Aside from its obvious use as a rain garment of unparalleled usefulness, it can serve its owner in many different and varied ways.

It will not only keep you dry in a hurricane, but your gear as well. It can be donned quickly, and fits just as well over a full back pack as it does without, and you can easily keep your rifle and ammo dry underneath as well.

The employment of a weapon from underneath a poncho can appear to present a few problems, but they are really very minor when compared to the benefit of a dry weapon.

If you are carrying a sub-gun or a shotgun, you can fire from underneath the poncho, a la Clint Eastwood, and if a little effort is used to stand sideways to the target and extend the barrel past the edge of the poncho, the poncho will receive no more damage than a few powder burns.

If you have a rifle, the easiest way to employ it is to firmly hold the fore end in your left hand, extend your left arm fully, with the rifle at a 90 degree angle to the arm, and with the muzzle pointing skyward. Then with a simple twist of the left wrist, you can bring the butt of the rifle to your right shoulder, and the trigger to your waiting right hand (much easier to do than explain).

You will find that the liner has no hole or hood for your head, like the rainproof shell does. I have seen people in the field cut holes in them, but that is a real waste, and in little time, the hole will fray and the batting will pull out, leaving you with a worthless rag.

The best way to wear the liner in cold wet weather is to hold it long ways, with a corner in each hand, and flip it over your head so that it lays on your back like a cape. Pull the corners in your hands down over your shoulders, until they extend below your wrist in the front. Secure the liner around your waist with a belt or piece of line, and then put on the poncho as usual.

During cold weather, you will find the poncho and liner quite warm, and that it breaks the wind very effectively. Remember, a blanket worn poncho style kept many an Indian brave warm well before the use of down and synthetic insulation.

PHOTOS BY DIANNA D. McSWAIN



Displayed here are an opened poncho, a poncho liner and a rolled poncho.



The wearer is preparing to pull the poncho liner over his shoulders to wear it as a cape.



A poncho with liner is tied in and folded over and snapped together to form a sleeping bag.



Two ponchos are snapped together and used to make a tent.

You can also use the poncho and liner as an improvised sleeping bag. Lay the poncho flat on the ground, and spread the liner out on top of it. Tie all of the liner's fasteners to the corresponding grommets in the poncho. Then fold the poncho in half, with the liner inside, and snap the snaps along the bottom and long edge of the poncho, and also tie the liners fasteners together. Don't forget to leave the top open, so you can get inside. Do not attempt to tape or seal the open seams along the side of the poncho. The reason for this is that the poncho is waterproof, and if adequate ventilation is not provided, you will wake up to a very wet sleeping bag, due to condensation of body moisture. This makes a very comfortable sleeping bag, and will keep you warm down to about 40 degrees F.

To pitch the tent, cut two poles about four feet long, and drive them about a foot into the ground, about six and a half feet apart. Drive a stake about three feet in front of and in line with the front upright. Tie one end of a line 15 feet long or more to the stake, tie it to the first upright with a couple of half hitches, tie it to the second upright, and then tie the free end to another stake at least three feet behind the

last upright. Throw the snapped-together ponchos over the frame, and stake down the edges. Use your liners as blankets or sleeping bags, and sleep in sheltered comfort.

You could also string the ridge line between two trees or other objects, and weight the sides down rather than use stakes, if there were none available.

The poncho can be used as a tarp, equipment cover, solar still, sun shade, stretcher, and even for an equipment or personnel raft.

To use it as a raft for keeping equipment dry when crossing deep water, you should lay the poncho out flat, and stack cut brush and branches on one side of it. Then fold the poncho over the branches, and snap all the snaps together with their corresponding snaps, and lace a line through all the grommets. If you use care in distributing your load, this type of raft will keep 30 to 35 pounds of gear well above the water.

As you can see, the poncho and liner are some of your most useful and valuable field equipment. Take care of it, and it will take care of you. It's small, lightweight, and fits easily into the trunk of a car, or behind the seat of a truck. ●

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